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**Teaching and Learning International Survey (TALIS) 2024 Technical Report: Version 3**

*The complete document is only available in PDF format.*

We are pleased to share Version 3 of the *Teaching and Learning International Survey (TALIS) 2024 Technical Report*. This now includes content covering the Teacher Knowledge Survey. A final version of the technical report will be published as an official OECD publication later this year.

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TALIS

# **Teaching and Learning International Survey (TALIS) 2024 Technical Report**

**Version 3**



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Note by all the European Union Member States of the OECD and the European Union

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# Abbreviations and acronyms

| Abbreviation/Acronym | Description                                                                                                        | Comment                                                                   |
|----------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <b>ACER</b>          | Australian Council for Educational Research                                                                        | Consortium partner for the TALIS core survey and Teacher Knowledge Survey |
| <b>AV</b>            | Adaptation verification                                                                                            |                                                                           |
| <b>BRR</b>           | Balanced repeated replication                                                                                      | Used with Fay's variation in TALIS                                        |
| <b>cApStAn</b>       | cApStAn Linguistic Quality Control                                                                                 | Consortium partner for all TALIS components                               |
| <b>CFA</b>           | Confirmatory factor analysis                                                                                       |                                                                           |
| <b>CFI</b>           | Comparative fit index                                                                                              |                                                                           |
| <b>CMC</b>           | Two-option complex multiple-choice                                                                                 |                                                                           |
| <b>ConQuest</b>      | ACER computer programme for fitting unidimensional and multidimensional item response and latent regression models | Software                                                                  |
| <b>CQ-S/M</b>        | Combined questionnaire short/main, for staff with leader duties                                                    |                                                                           |
| <b>CSV</b>           | Comma-separated value                                                                                              | Data file format                                                          |
| <b>DIF</b>           | Differential item functioning                                                                                      |                                                                           |
| <b>DME</b>           | IEA Data Management Expert                                                                                         | IEA software                                                              |
| <b>DPE</b>           | IEA Data Processing Expert                                                                                         | IEA software                                                              |
| <b>EC</b>            | European Commission                                                                                                |                                                                           |
| <b>ECEC</b>          | Early childhood education and care                                                                                 |                                                                           |
| <b>EFA</b>           | Exploratory factor analysis                                                                                        |                                                                           |
| <b>EM</b>            | Expectation-maximization                                                                                           |                                                                           |
| <b>ESE</b>           | Environmental and sustainability education                                                                         |                                                                           |
| <b>EU</b>            | European Union                                                                                                     |                                                                           |
| <b>FSD</b>           | Factor score determinacy                                                                                           |                                                                           |
| <b>FT</b>            | Field trial                                                                                                        |                                                                           |
| <b>GPCM</b>          | Generalised partial credit model                                                                                   |                                                                           |
| <b>GPk</b>           | General pedagogical knowledge                                                                                      |                                                                           |
| <b>ICC</b>           | Intraclass correlation coefficient                                                                                 |                                                                           |
| <b>ICCS</b>          | IEA International Civic and Citizenship Study                                                                      |                                                                           |
| <b>ICILS</b>         | IEA International Computer and Information Literacy Study                                                          |                                                                           |
| <b>ID</b>            | Identification number                                                                                              |                                                                           |
| <b>IDB</b>           | International database                                                                                             |                                                                           |
| <b>IDB Analyzer</b>  | IEA IDB Analyzer for SPSS, SAS and R                                                                               | IEA software                                                              |
| <b>IEA</b>           | International Association for the Evaluation of Educational Achievement/Foundation IEA Secretariat Netherlands     |                                                                           |
| <b>IELS</b>          | OECD International Early Learning and Child Well-being Study                                                       |                                                                           |

| Abbreviation/Acronym | Description                                                                                                              | Comment                         |
|----------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| ILSA                 | International large-scale assessment                                                                                     |                                 |
| IQO                  | International quality observer                                                                                           | Contracted by IEA Amsterdam     |
| IRT                  | Item response theory                                                                                                     |                                 |
| ISC                  | International study centre                                                                                               | Located at IEA Hamburg, Germany |
| ISCED                | UNESCO International Standard Classification of Education                                                                | 2011 edition used               |
| ISCED level 02       | Early childhood education (pre-primary education)                                                                        | Part of ISCED level 0           |
| ISCED level 1        | Primary school                                                                                                           |                                 |
| ISCED level 2        | Lower secondary school                                                                                                   |                                 |
| ISCED level 3        | Upper secondary school                                                                                                   |                                 |
| ISO                  | International Organization for Standardization                                                                           |                                 |
| LQ                   | Leader questionnaire                                                                                                     |                                 |
| MAR                  | Missing at random                                                                                                        |                                 |
| MCAR                 | Missing completely at random                                                                                             |                                 |
| MGCFA                | Multiple-group confirmatory factor analysis                                                                              |                                 |
| MI                   | Multiple imputation                                                                                                      |                                 |
| ML                   | Maximum likelihood                                                                                                       |                                 |
| MLR                  | Maximum likelihood robust                                                                                                |                                 |
| MNAR                 | Missing not at random                                                                                                    |                                 |
| MOS                  | Measure of size                                                                                                          |                                 |
| Mplus                | Flexible statistical analysis software that fits an extensive variety of statistical models using one of many estimators | Software                        |
| MS                   | Main survey                                                                                                              |                                 |
| NA                   | Not applicable                                                                                                           |                                 |
| NADB                 | National Adaptations Database                                                                                            |                                 |
| NAF                  | National adaptation form                                                                                                 |                                 |
| NDM                  | National data manager                                                                                                    |                                 |
| NPM                  | National project manager                                                                                                 |                                 |
| NQO                  | National quality observer                                                                                                | Contracted by national centre   |
| NRBA                 | Non-response bias analysis                                                                                               |                                 |
| NSM                  | National sampling manager                                                                                                |                                 |
| ODC                  | Online data collection                                                                                                   |                                 |
| OECD                 | Organisation for Economic Co-operation and Development                                                                   |                                 |
| OTL                  | Opportunities to learn                                                                                                   |                                 |
| P&P                  | Paper and pencil                                                                                                         |                                 |
| PIAAC                | OECD Programme for the International Assessment of Adult Competencies                                                    |                                 |
| PIRLS                | IEA Progress in International Reading Literacy Study                                                                     |                                 |
| PISA                 | OECD Programme for International Student Assessment                                                                      |                                 |
| PQ                   | Principal questionnaire                                                                                                  |                                 |
| PPS                  | probability proportional to size                                                                                         |                                 |
| PUF                  | Public use file                                                                                                          |                                 |
| PV                   | Plausible value                                                                                                          |                                 |
| QEG                  | Questionnaire Expert Group                                                                                               |                                 |
| R                    | The R Project for Statistical Computing                                                                                  | Software                        |

| Abbreviation/Acronym            | Description                                                                               | Comment                                                                                                            |
|---------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>RAND Europe</b>              | Research and Development Europe, not for profit research institute                        | Consortium partner for TALIS Starting Strong, part of RAND Corporation                                             |
| <b>RandA</b>                    | Research and Analysis Team                                                                | Unit within IEA Hamburg                                                                                            |
| <b>repest</b>                   | OECD Stata module to run estimations with weighted replicate samples and plausible values | Software                                                                                                           |
| <b>RMSEA</b>                    | Root mean square error of approximation                                                   |                                                                                                                    |
| <b>Rrepest</b>                  | OECD R library to run estimations with weighted replicate samples and plausible values    | Software                                                                                                           |
| <b>RUF</b>                      | Restricted use file                                                                       | Data product                                                                                                       |
| <b>S.D.</b>                     | Standard deviation                                                                        |                                                                                                                    |
| <b>S.E.</b>                     | Standard error                                                                            |                                                                                                                    |
| <b>SAQ</b>                      | Survey activities questionnaire                                                           |                                                                                                                    |
| <b>SAS</b>                      | Statistical Analysis System                                                               | Software                                                                                                           |
| <b>SC</b>                       | School co-ordinator                                                                       |                                                                                                                    |
| <b>SE</b>                       | IEA StudyExpert                                                                           | IEA software                                                                                                       |
| <b>SEM</b>                      | Structural equation modelling                                                             |                                                                                                                    |
| <b>SJT</b>                      | Situational judgement task                                                                |                                                                                                                    |
| <b>SMC</b>                      | Four-option simple multiple-choice                                                        |                                                                                                                    |
| <b>SOP</b>                      | Survey operations procedure                                                               |                                                                                                                    |
| <b>SPSS</b>                     | Statistical Package for the Social Sciences                                               | Software                                                                                                           |
| <b>SQ</b>                       | Staff questionnaire                                                                       |                                                                                                                    |
| <b>SRMR</b>                     | Standardized root mean square residual                                                    |                                                                                                                    |
| <b>Stata</b>                    | Statistics and Data                                                                       | Software                                                                                                           |
| <b>StatCan</b>                  | Statistics Canada                                                                         |                                                                                                                    |
| <b>TAG</b>                      | Technical Advisory Group                                                                  |                                                                                                                    |
| <b>TALIS</b>                    | OECD Teaching and Learning International Survey                                           |                                                                                                                    |
| <b>TALIS Starting Strong IG</b> | Informal group governing TALIS Starting Strong                                            | Informal group of countries and territories participating in TALIS Starting Strong                                 |
| <b>TGB</b>                      | TALIS Governing Board                                                                     |                                                                                                                    |
| <b>TIMSS</b>                    | IEA Trends in International Mathematics and Science Study                                 |                                                                                                                    |
| <b>TKEG</b>                     | Teacher Knowledge Expert Group                                                            |                                                                                                                    |
| <b>TKS</b>                      | TALIS Teacher Knowledge Survey                                                            |                                                                                                                    |
| <b>TLF</b>                      | Teacher listing form                                                                      | Form produced by IEA WinW3S                                                                                        |
| <b>TLI</b>                      | Tucker-Lewis Index                                                                        |                                                                                                                    |
| <b>TQ</b>                       | Teacher questionnaire                                                                     |                                                                                                                    |
| <b>TTF</b>                      | Teacher tracking form                                                                     | Form produced by IEA WinW3S                                                                                        |
| <b>U3/Under 3</b>               | Early childhood education accommodating children under the age of three years             | Operational definition in TALIS Starting Strong, not formally part of ISCED level 0, yet related to ISCED level 01 |
| <b>UNESCO</b>                   | United Nations Educational, Scientific and Cultural Organization                          |                                                                                                                    |
| <b>UNESCO-UIS</b>               | UNESCO Institute for Statistics                                                           |                                                                                                                    |
| <b>WinW3S</b>                   | IEA Within-School Sampling Software                                                       | IEA software                                                                                                       |
| <b>WLSMV</b>                    | Weighted least squares mean variance                                                      |                                                                                                                    |
| <b>WRMR</b>                     | Weighted root mean square residual                                                        |                                                                                                                    |

### Three-digit operational codes of TALIS 2024 participants

| Participating country/territory | Code |
|---------------------------------|------|
| Albania                         | ALB  |
| Alberta (Canada)                | CAB  |
| Australia                       | AUS  |
| Austria                         | AUT  |
| Azerbaijan                      | AZE  |
| Bahrain                         | BHR  |
| Belgium                         | BEL  |
| Flemish Community (Belgium)     | BFL  |
| French Community (Belgium)      | BFR  |
| Brazil                          | BRA  |
| Bulgaria                        | BGR  |
| Chile                           | CHL  |
| Colombia                        | COL  |
| Costa Rica                      | CRI  |
| Croatia                         | HRV  |
| Cyprus <sup>1</sup>             | CYP  |
| Czechia                         | CZE  |
| Denmark                         | DNK  |
| Estonia                         | EST  |
| Finland                         | FIN  |
| France                          | FRA  |
| Hungary                         | HUN  |
| Iceland                         | ISL  |
| Israel                          | ISR  |
| Italy                           | ITA  |
| Japan                           | JPN  |
| Kazakhstan                      | KAZ  |
| Korea                           | KOR  |
| Kosovo*                         | XKX  |
| Latvia                          | LVA  |
| Lithuania                       | LTU  |
| Malta                           | MLT  |
| Montenegro                      | MNE  |
| Morocco                         | MAR  |
| Netherlands                     | NLD  |
| New Brunswick (Canada)          | CNB  |
| New Zealand                     | NZL  |
| North Macedonia                 | MKD  |
| Norway                          | NOR  |

| Participating country/territory | Code |
|---------------------------------|------|
| Poland                          | POL  |
| Portugal                        | PRT  |
| Quebec (Canada)                 | CQU  |
| Romania                         | ROU  |
| Saudi Arabia                    | SAU  |
| Serbia                          | SRB  |
| Shanghai (China)                | CSH  |
| Singapore                       | SGP  |
| Slovak Republic                 | SVK  |
| Slovenia                        | SVN  |
| South Africa                    | ZAF  |
| Spain                           | ESP  |
| Sweden                          | SWE  |
| Türkiye                         | TUR  |
| United Arab Emirates            | ARE  |
| United States                   | USA  |
| Uzbekistan                      | UZB  |
| Viet Nam                        | VNM  |

1. Collected data through the IEA International Study Centre.

\*This designation is without prejudice to positions on status, and is in line with United Nations Security Council Resolution 1244/99 and the Advisory Opinion of the International Court of Justice on Kosovo's declaration of independence.



# Executive summary

## Chapter 1. Introduction

Chapter 1 provides an overview of the OECD Teaching and Learning International Survey (TALIS) 2024, including its two complementary components: the Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) and the Teacher Knowledge Survey (TKS). The chapter summarises the survey's purpose, scope, design and governance and introduces the technical standards underpinning its implementation.

TALIS collects internationally comparable data on the learning environment and working conditions of teachers and principals, enabling countries/territories to analyse key aspects of teaching and learning and to inform policy development. Since the first cycle in 2008, the programme has expanded significantly, with 56 countries and territories participating in at least 1 component in 2024. While originally focused on lower secondary education (International Standard Classification of Education [ISCED] level 2), TALIS now also offers coverage of primary (ISCED 1) and upper secondary (ISCED 3) levels.

TALIS Starting Strong, first conducted in 2018, extends the survey to leaders and staff in early childhood education and care (ECEC) settings at ISCED level 02 and, where applicable, for children under three years of age (U3). The TKS, introduced in this TALIS cycle, assessed the general pedagogical knowledge (GPK) of lower secondary teachers across three domains: instruction, learning and assessment.

The 2024 cycle was co-ordinated by the OECD with an international consortium led by the International Association for the Evaluation of Educational Achievement (IEA) and supported by partner organisations. Data collection was conducted primarily on line, with rigorous quality assurance procedures applied throughout to ensure validity, reliability and cross-national comparability.

This chapter also outlines the survey's governance at the international and national levels and introduces the three main phases of implementation, pilot, field trial and main survey.

The present 2024 technical report is based on the technical reports of previous TALIS cycles, especially those of TALIS 2018 and TALIS Starting Strong 2018.

## Chapter 2. Conceptual framework development

The TALIS 2024 initiative, co-ordinated by the OECD in collaboration with international research partners, builds upon its earlier cycles to expand the global evidence base on teachers, teaching and learning environments for the TALIS core survey and on leaders and staff in ECEC settings for TALIS Starting Strong. Chapter 2 outlines the conceptual development for three key components: the TALIS 2024 core survey (ISCED levels 1-3), TALIS Starting Strong (focused on ECEC) and the TKS, a new component assessing teachers' GPK.

A strategic concept paper was created collaboratively by the IEA, the Australian Council for Educational Research (ACER) and research institute RAND Europe in consultation with international stakeholders. It identified both enduring domains (e.g. staff development, occupational perceptions, institutional environments) and new priorities (e.g. diversity and equity, educational technology and social-emotional learning). The paper informed the development of individual frameworks and served as a guiding document for aligning TALIS 2024 content foci with policy interests.

The TALIS core survey maintains its focus on instructional conditions, institutional contexts and trends in the teaching profession, while also integrating contemporary themes such as:

- equity and diversity
- technology in education, including artificial intelligence
- social-emotional learning
- environmental and sustainability education.

The Questionnaire Expert Group (QEG) – comprising international experts in education, policy and survey methodology – oversaw the content development. The framework integrates both traditional and emerging domains, balancing policy relevance with longitudinal consistency, and supports cross-national comparability through robust indicators and carefully constructed instruments.

TALIS Starting Strong focussed on ECEC; this component continued from 2018 with a renewed focus on:

- equity and quality in early learning
- workforce motivation and retention
- process and structural quality in ECEC.

The ECEC Questionnaire Expert Group (ECEC QEG) guided the conceptual framework, ensuring alignment with policy needs and emerging themes such as digital technology in practitioner development, inclusive practices and comprehensive child support approaches. Inputs from participating countries/territories helped identify priority areas and retained content from 2018, enabling both innovation and trend analysis.

Introduced in TALIS 2024, the TKS aimed to deepen understanding of teachers' GPK, a cornerstone of professional competence. Key policy interests include:

- teachers' knowledge of instructional strategies and classroom management
- responses to diversity and socio-emotional learning
- preparation for contemporary teaching challenges.

Developed by ACER with input from the Teacher Knowledge Expert Group (TKEG), the framework draws from the OECD Centre for Educational Research and Innovation (CERI) model of teacher competence and links pedagogical knowledge to affective traits and teaching practices. It offers a detailed structure for assessing GPK and aligns with broader TALIS data for enriched analysis.

### Chapter 3. Questionnaire development

TALIS 2024 represents the fourth cycle in a long-standing effort to collect internationally comparable data on teachers, principals and their working environments. Building on the experiences of the 2008, 2013 and 2018 cycles, the 2024 survey aimed to reflect contemporary educational issues while retaining core elements necessary for trend analyses. The questionnaire development process was comprehensive and methodologically rigorous, involving multiple stakeholder consultations, pilot studies and field trials across the three main components: the TALIS core survey, TALIS Starting Strong and the TKS.

Targeting ISCED levels 1, 2 and 3, the core survey adopted a rotated questionnaire design aligned with analytical priorities to ensure comprehensive coverage without overburdening participants for the first time. The teacher and principal questionnaires were designed by QEG in consultation with the TALIS Governing Board (TGB) and further international experts. A pilot study was conducted as a paper-based retrospective exercise to evaluate question clarity and cross-cultural applicability. In the field trial, self-administered online questionnaires were used to refine item quality and selection. The three teacher forms were trialled further and allowed statistical evaluation of experimental item variants. The final materials in the main survey included 84 questions distributed across 3 forms.

Aimed at staff and leaders in ECEC settings, TALIS Starting Strong 2024 expanded participation beyond the 2018 cycle. The survey included separate instruments for staff and leaders and combined versions for persons who were staff and leaders at the same time, tailored for ISCED level 02 (pre-primary) and under 3 (U3) levels. Four thematic domains (staff practices, characteristics, setting characteristics and cross-cutting issues) framed the questionnaire development. Initially, stakeholders ranked and rated questions from 2018 by relevance, helping define content for the pilot. Eleven countries/territories tested instruments using paper-based surveys in focus groups. Feedback informed revisions regarding cultural relevance, clarity and response burden. The field trial administration online tested psychometric properties and item variants. Confirmatory and exploratory factor analyses validated item quality across diverse contexts. The main survey used common versions of the questionnaires for both ISCED level 02 and U3, with 49 questions for staff and 45 for leaders.

The TKS – as a new component assessing teachers' GPK – built on the OECD's prior Innovative Teaching for Effective Learning (ITEL) work. The GPK assessment evaluates teachers across three dimensions – instruction, learning and assessment – each subdivided and classified by cognitive demand, knowledge base and thematic relevance. The TKEG assessed 208 legacy items from the earlier ITEL activities, retaining 82 and developing 34 new ones. A pilot was conducted with small convenience samples, using cognitive labs and expert reviews to refine items. The field trial deployed 78 items in 6 balanced clusters along with 2 sets of contextual measures. Rasch modelling and factor analyses confirmed scale validity and unidimensionality. Finally, the main survey item pool included 52 GPK items (34 SMC, 18 CMC) covering all framework categories along with contextual materials based on the core survey and augmented with GPK-specific measures.

## Chapter 4. Preparation of national survey instruments

This chapter provides an overview of the procedures implemented for national adaptation verification, international translation verification and layout verification of the TALIS instruments. For each country/territory, all specified instruments in the identified target languages underwent adaptation verification, translation verification and layout verification before the field trial and main data collection of TALIS 2024. The same procedures were applied to all instruments (TALIS core survey, TALIS Starting Strong and the TKS).

The quality control procedures conducted during the production of national instruments helped to ensure the collection of high-quality data that can be compared internationally across countries/territories and over time. During the verification stages, the instruments for each country/territory and survey language were carefully cross-checked against the international source version, that is, the international (English) instruments, the versions for the different target populations and the versions used in the previous TALIS cycle (TALIS 2018). Adaptation verification involved a review and approval process by the international study centre (ISC) of adaptations (structural, non-structural, mandatory and elective) to the national instruments. The international translation verification process, co-ordinated by IEA Amsterdam with support from cApStAn Linguistic Quality Control, involved external language experts checking and comparing the national translations against the international source for errors, equivalency between versions and for longitudinal consistency of reoccurring items comparing the national translations against

the translations used in TALIS 2018. Layout verification, conducted by the ISC, compared the format, numbering, page layout and structure of the national instruments against the internal source version.

After the field trial and main survey, the ISC administered survey activities questionnaires (SAQs) to national project managers (NPMs) for collecting feedback. The majority of the 57 participating NPMs found the ISC's guidance on translation and verification clear and sufficient. Most reported that translation verification improved their instruments and that feedback from verifiers was beneficial. A large proportion made corrections based on verifier input.

## Chapter 5. Sampling design

This chapter outlines the sample design for TALIS 2024, including its strategic objectives, international standards and national adaptations. The sampling approach aimed to provide statistically robust and internationally comparable data on teachers, principals, early childhood staff and leaders across different educational levels.

TALIS 2024 focused on teachers and principals in ISCED level 2 (lower secondary education), with optional components for ISCED level 1 (primary) and ISCED level 3 (upper secondary). The international sampling design followed a stratified two-stage cluster sampling approach: schools were selected first, followed by teachers within those schools. Principals of selected schools completed a separate questionnaire.

The survey covered all teachers at the relevant ISCED levels in regular schools. Those teaching exclusively adults or working in schools for special education needs were excluded. A principal was defined as the individual with the highest level of administrative or pedagogical responsibility. National adaptations were permitted within a 5% exclusion threshold to preserve international comparability.

To ensure statistical precision and subgroup reliability, an effective teacher sample size of 400 per country/component was targeted, assuming a design effect of 5.2 due to clustering and other design features. The standard plan involved selecting 200 schools and 20 teachers per school, amounting to 4 000 teachers nominally. If school sizes were smaller than expected, more schools were added to meet participation targets.

NPMs collaborated with the sampling team to customise the international plan where necessary. Countries/territories provided comprehensive school lists (sampling frames), including variables for stratification such as geographic region or school type. Stratification improved sampling efficiency and enabled focused subgroup analysis. Samples were selected using systematic random sampling with probability proportional to size (PPS), including pre-assigned replacement schools to mitigate non-response bias.

Teachers were sampled using the IEA Windows Within-School Sampling Software (WinW3S), ensuring consistency and transparency. The software facilitated within-school teacher selection and supported documentation requirements. Measures were taken to avoid overlap where schools participated in multiple components.

A field trial was conducted ahead of the main survey to test procedures. For each country/territory, 30 schools were sampled, with distinct selections to minimise overlap between field trial and main sample, thereby reducing burden on schools.

This detailed yet flexible sampling strategy ensured reliable, policy-relevant insights while accommodating national contexts, thereby supporting TALIS 2024's objective to inform educational improvement globally.

To establish the sample size for the TALIS Starting Strong component, an effective sample of 400 staff members was targeted, based on a design effect of 2. This resulted in an actual sample size requirement of 1 200 staff in 180 settings. Each selected ECEC setting was expected to provide eight staff members. Minimum expected response rates were 75% on setting and staff levels.

Further information on the sampling implementation is available in Annex D, where detailed documentation for each participating country or territory is provided. This includes the statistical characteristics of the target population, applied exclusions, specifics of the sampling design and data on the realised sample. These reports offer transparency on how the international sampling requirements were applied for each jurisdiction within their national context.

## Chapter 6. Field operations

The TALIS 2024 field operations were successfully implemented across all participating countries and territories, with no major disruptions reported. The chapter outlines the comprehensive procedures followed by national centres in administering the survey, including school and ECEC setting contact, within-school/-ECEC setting sampling, data collection monitoring and adherence to international technical standards across multiple ISCED levels (1, 2 and 3), TALIS Starting Strong, and the TKS.

All countries/territories were required to follow stringent procedures set by the ISC, with deviations permitted only by prior agreement with the TALIS consortium and the OECD. National centres operated under a robust framework comprising technical standards, extensive manuals, instructional videos and specialised software (notably IEA StudyExpert, IEA WinW3S and IEA Data Management Expert [DME]). These tools ensured consistency, quality and comparability in data collection and processing.

Survey preparation spanned three to six months, with timelines varying depending on hemisphere and complexity. Countries/territories administering multiple instruments (e.g. Chile and Morocco) or conducting the survey in multiple languages (e.g. Spain) required extended preparation. The TALIS core survey remained the central focus, with national instruments and procedures prioritised accordingly.

National centres managed contacts with a minimum of 200 schools or 180 ECEC settings per target population. Replacement schools/ECEC settings were used to maintain participation rates, with some national centres, such as Ireland, adopting non-standard sampling approaches. Co-ordination within each institution was managed by designated staff, who played a crucial role in listing, sampling and administering instruments. To ensure confidentiality and smooth operations, many national centres used tailored tracking systems, communication tools and dedicated hotlines.

Data collection windows differed between hemispheres (February-April 2024 for the north, June-August 2024 for the south), though many countries/territories extended beyond these periods to optimise response rates. Monitoring of questionnaire completion was performed using various tools and communication channels. All national centres successfully verified participation statuses before data submission.

Finally, national centres implemented their own quality assurance programmes based on templates from the ISC. Observers were often internal staff or qualified external personnel, and their findings were later reported in a dedicated SAQ. The ISC provided continuous training and support throughout the process, ensuring fidelity to international standards and successful survey execution across diverse national contexts.

## Chapter 7. Quality control - International and national quality observations

Chapter 7 outlines the comprehensive quality control programme implemented to ensure the consistency, accuracy and comparability of data collected across participating countries and territories. This programme covered all TALIS components, including the TALIS core survey (ISCED levels 1, 2 and 3), TALIS Starting Strong (ISCED level 02 and U3) and the TKS. The quality control efforts, co-ordinated by IEA Amsterdam and the TALIS international consortium, comprised four main pillars: i) the international quality observation programme; ii) the national quality observation programme; iii) additional quality control questions included in the survey instruments; and iv) a follow-up SAQ completed by NPMs.

IEA Amsterdam led the IQO programme by appointing independent observers in each participating country/territory. The observer's tasks included interviewing the NPM about TALIS 2024 activities, collecting and reviewing specific materials needed for national centres to conduct the survey (such as the School/ECEC Setting Co-ordinator Manual) as well as conducting online interviews with co-ordinators from randomly selected schools or ECEC settings. Overall, outcomes of the NPM interview as well as the co-ordinators manual review showed that countries/territories closely followed the international survey procedures. With regards to the co-ordinators interview, IQOs reported that, in close to 90% of cases, the complete list of survey materials was correctly received by the schools, and that their understanding of the survey administration procedures and use of associated materials was as expected. Observers also reported that the sampling procedures were in line with the international guidelines in above 85% of cases.

With regards to the national quality observation programme to be implemented by NPMs, most countries/territories (44 out of 57) conducted structured observations at the national level, though approaches varied. Some employed direct school/ECEC setting visits, while others used digital feedback methods. National observations helped surface common challenges such as overlong questionnaires, difficulties in understanding definitions of target populations, and burdens on schools and ECEC settings.

In addition, extra quality control questions embedded at the end of survey provided direct feedback from TALIS respondents on their experience when completing the questionnaires. Randomly administered to 20% of respondents per component, these questions focused on survey selection, administration conditions and perceptions of confidentiality. Overall, respondents reported that they were selected to participate in TALIS in a way that was consistent with the TALIS technical standards and that they were provided sufficient time to complete the survey. Furthermore, respondents reported that most of the survey questions functioned well, but that some could have been unclear and should be modified for future cycle.

Lastly, the SAQ enabled NPMs to report on all aspects of survey implementation, including instrument translation, school recruitment, online and paper administration and co-ordinator support.

## Chapter 8. Creating and checking the international databases

Chapter 8 outlines the processes, standards and quality assurance measures used to construct, verify and finalise the national and international databases for the TALIS 2024 core survey, TALIS Starting Strong and the TKS. The work required close co-ordination between the ISC, national centres, the OECD Secretariat and all consortium partners to ensure accurate, comparable and high-quality datasets. All data processing adhered to OECD Data Protection Rules and, where relevant, national and regional privacy laws (e.g. European Union General Data Protection Regulation).

NPMs and, where designated, national data managers oversaw data collection, entry, verification and submission to the ISC. Both online (default for 2024) and paper modes were supported, with strict protocols to ensure mode comparability in questionnaire content, layout and administration procedures. Data from paper questionnaires were entered “as is” into the IEA DME software, following predefined coding rules and double-entry checks.

The ISC then integrated online and paper data with sampling/tracking information, harmonising structures, codes and formats. Duplicate cases – from a small number of respondents who switched between languages – were systematically resolved. Structural deviations due to national adaptations were documented and harmonised to align with the international codebooks, while retaining original national variables for local reporting.

Identification and linkage variables were cleaned to ensure accurate matching of respondents to schools/settings. Logical, numerical and range checks identified implausible or inconsistent responses, which were either automatically corrected or resolved in consultation with national centres. Special treatments addressed filter-dependent questions, “check-all-that-apply” questions, percentage totals and



implausible numeric values. Missing codes differentiated between “not administered”, “omitted or invalid”, “logically not applicable”, and “not reached” (TKS only) responses, supporting nuanced analysis and accurate handling of non-response patterns.

Database development followed an iterative work and release process. A first data version was identifier/linkage-cleaned for weighting and to conduct non-response bias analyses. The second version was weighted and largely cleaned datasets for OECD and national review, followed by formal data sign-off. The third version included derived variables, scale scores and other post-collection adjustments and corrections before and after the review of draft reporting chapters and tables. Minor data versions addressed per country/territory updates in-between major releases.

Two main data products were produced. The restricted use files (RUF) were comprehensive and confidential datasets for national centres and the OECD, released under embargo to prepare international and national reports. The public use files (PUF) were prepared for wider public dissemination and were subject to general and country/territory-specific suppressions of variables and/or coarsening variables to reduce re-identification risk.

## Chapter 9. Estimation weights, participation rates and sampling error

This chapter outlines the methodology underpinning the statistical quality of TALIS 2024 outcomes, focusing on estimation weights, participation rates and the measurement of sampling error. Due to the complex nature of sampling in international large-scale assessments, TALIS implemented robust weighting procedures and adopted balanced repeated replication (BRR) to ensure precision and unbiasedness in its estimates.

TALIS 2024 used stratified multi-stage probability sampling plans tailored to national contexts. Estimation weights were applied to correct for unequal selection probabilities and non-response, thus ensuring national estimates reflect the broader target population.

Separate weights were calculated for each survey component and for each population group (teachers and principals or staff and leaders), with adjustments made at each sampling stage. It is critical to distinguish between weights used for different analyses, especially in multi-level models, where misuse could introduce bias.

High participation rates are essential for the reliability of TALIS estimates. TALIS 2024 established minimum response thresholds, 50% for teachers within schools and 33% for staff within early childhood settings for the institution to be considered participating. Non-response adjustments relied on the assumption that missing data were random within strata.

Participation rates were reported in both weighted and unweighted terms, before and after the inclusion of replacement schools/settings. While replacements helped achieve minimum participation thresholds, excessive use risked compromising the probabilistic nature of the sample. Detailed national participation rates are presented in Annex F.

To measure the precision of estimates, TALIS employed BRR, a replication method suited to complex survey designs. For each estimate, BRR provides replicate estimates based on reweighting subsets of the data, allowing for accurate variance estimation without relying on overly restrictive assumptions.

TALIS used Fay’s variant of BRR to moderate the impact of dropping entire sampling units in replicates. In this method, weights are only partially adjusted (usually 1.5 and 0.5 factors), minimising the risk of eliminating entire subgroups from replicates. Pseudo-strata or “zones” were created by pairing sampled schools/settings within explicit strata to simulate a BRR-ready design.



Sampling errors were computed for various comparisons, within and between countries/territories or across TALIS cycles, using BRR-derived standard errors. These errors enable the calculation of confidence intervals and support hypothesis testing in cross-national comparisons or subgroup analyses.

The design effect (deff) quantifies the efficiency loss due to the complex design relative to simple random sampling. Most deff values in TALIS ranged around or below the assumed thresholds, with values near 1 indicating high efficiency. Effective sample sizes, derived from observed deff values, were often larger than anticipated, supporting robust population estimates and allowing for more detailed subgroup analyses.

## Chapter 10. Data adjudication

The adjudication process in TALIS 2024 ensures that the data collected across participating countries and territories meet standards of quality, reliability and international comparability. This process is critical to confirm that the resulting data are “fit for use” and can effectively inform policy.

Adjudication involved evaluating each education system’s implementation of the survey across key phases: questionnaire adaptation, translation, sampling, data collection and data processing. Specific attention was given to issues such as inadequate national questionnaire adaptation, inconsistent translation of trend items, biased or incomplete teacher/staff lists, deviations from sampling procedures, data cleaning issues and low participation rates. Data were judged separately for school/principal and teacher/staff modules.

Each dataset underwent detailed scrutiny during adjudication sessions held in late 2024. Consortium members responsible for each survey component examined unresolved issues and their potential impact on data usability. Particular consideration was given to whether any non-response bias was likely and whether it could compromise national or international comparisons.

Participation thresholds set in the TALIS 2024 Technical Standards played a key role in the rating system. Countries/territories with participation rates below 75% were required to submit a non-response bias analysis (NRBA) to assess potential bias. However, such analyses can only provide indications of closeness to known population values and cannot confirm comparability between countries or subgroups.

Adjudication ratings ranged from “Good” to “Insufficient” based on participation rates before and after replacements, presence of non-response bias and evidence from NRBA. Ratings were defined as follows:

- Good: full use permitted, including international comparison.
- Fair: generally usable data with caveats about estimate precision or possible data quality concerns.
- Poor: data limitations significant enough to restrict use, particularly for subnational or international comparisons.
- Insufficient: data not suitable for inclusion in international analyses.

These ratings guide data users in understanding the strengths and limitations of each dataset. A full breakdown of adjudication outcomes and participation rates is provided in Annex F.

## Chapter 11. Construction and validation of questionnaire scales for TALIS and TALIS Starting Strong

The TALIS 2024 survey instruments collect data on various school, principal, teacher, staff and leader characteristics, including perceptions, attitudes and practices. To capture these dimensions, the TALIS datasets include:

- simple indices: derived from single items or aggregates (e.g. student-teacher ratio), aimed at preserving respondent anonymity and summarising observable traits

- scale scores: constructed from multiple questionnaire items targeting a shared latent construct (e.g. self-efficacy), using confirmatory factor analysis (CFA) to model unobservable traits.

While simple indices summarise tangible data, scale scores delve into underlying attributes not directly measurable, relying on robust psychometric modelling and validation. CFA was employed to evaluate unidimensional latent structures. Ordinal item responses (e.g. Likert scales) were analysed using categorical CFA, allowing appropriate treatment of non-continuous data. Where needed, models were refined through item removal or re-specification, guided by both statistical indicators and conceptual considerations. Evaluation occurred at both country/territory and international levels.

Only scales passing reliability and model fit thresholds were retained, ensuring their robustness across diverse national contexts. Where necessary, exceptions were made for theoretically essential items, even if statistical properties were suboptimal. Scale scores were computed using Empirical Bayes modal estimation based on CFA model parameters from the pooled international datasets consisting of ISCED level 2 countries/territories for the TALIS core survey and the TKS, and ISCED level 02 countries/territories for TALIS Starting Strong. Respondents needed at least two valid responses to receive a score. Scores were standardised so that a score of 10 corresponds to the midpoint of the item response scale. For composite scores, subscale scores were averaged, acknowledging potential measurement limitations (e.g. formative rather than reflective indicators).

TALIS 2024 scale scores support:

- within- and cross-country/territory comparisons, due to consistent international modelling
- regression analyses and group comparisons (provided invariance criteria are met).

However, scores are not directly comparable across different scales or TALIS cycles, as standardisation and modelling are independent per scale and cycle. Additional caution is advised when interpreting composite scales and for selected scales with model fit issues in single country/territory models or in the most constrained multi-group models.

## Chapter 12. Construction and validation of questionnaire scales for TKS

The Teacher Knowledge Survey (TKS) assessed the general pedagogical knowledge (GPK) of lower secondary teachers across three domains: instruction, learning, and assessment. This chapter presents the psychometric analyses of the GPK assessment, which informed item selection, scaling, and the development of the final GPK scale. Key areas of focus included item-level performance, dimensionality, reliability, and measurement invariance across national samples and gender. In addition, missing data patterns and test targeting were examined to ensure data quality. The resulting scale enables robust cross-national comparisons and meaningful interpretation of teachers' GPK proficiency.

The GPK assessment items were scaled using item response theory (IRT), applying a two-parameter logistic (2PL) model for dichotomous items and the generalized partial credit model (GPCM) for polytomous items. Test targeting was evaluated by comparing item difficulty distributions with teachers' GPK proficiency levels, indicating generally good alignment, although fewer items covered very low and very high proficiency levels. IRT reliability estimates were satisfactory across both national/territorial and international samples.

Item analyses examined item difficulty (facility), item-rest correlations, discrimination, and model fit statistics, demonstrating overall strong psychometric quality. However, three items showed very low discrimination and were removed from the final scaling. These decisions were supported by consistent findings across both international and national calibrations.

In addition, multidimensional IRT analyses were conducted to explore potential subscales based on content domains and knowledge types. The very high correlations between dimensions indicated that GPK

can be treated as a unidimensional construct. Consequently, a single overall GPK scale was retained for reporting. Differential item functioning (DIF) analyses were also performed to assess measurement invariance across national samples and gender. While some items exhibited country-specific variation, these were either removed or treated as national items. Gender-related DIF was minimal, with only a small number of items exceeding the threshold for notable differences.

For the final scaling, the GPCM was applied, and plausible values (PVs) were generated as estimates of teachers' GPK proficiency. Using item parameters anchored at the internationally calibrated values, PVs were drawn from the posterior distribution for each national sample separately, based on a conditioning model incorporating both item responses and contextual data. Five plausible values were generated for each teacher, providing a robust basis for estimating measurement error and standard errors in subsequent analyses. The plausible values were transformed to an international metric, where the average score was set to 250 and the standard deviation to 50 for the international dataset using senate weights.

Finally, a described scale of GPK was developed to support interpretation and future cross-national comparisons. Three proficiency levels were defined: foundational, established, and advanced. This framework balances interpretability with empirical evidence should additional items be developed in any future cycles.

# 1 Introduction

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This chapter provides an overview of the survey components and the preparation and implementation of the Teaching and Learning International Survey (TALIS) 2024, initiated and co-ordinated by the Organisation for Economic Co-operation and Development (OECD). It introduces the management structure established to administer this fourth cycle of the survey, the target populations and educational levels investigated, the role of the national project managers, the key development phases of the survey and the standardised procedures implemented to allow the collection of high-quality data in 56 countries and territories.

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## 1.1. TALIS, TALIS Starting Strong and Teacher Knowledge Survey in brief

This technical report documents the development and implementation of the OECD Teaching and Learning International Survey (TALIS) 2024. In particular, the report covers: the development of the TALIS questionnaires; sampling operations; data collection, weighting, scaling and analysis. It enables readers to review and understand these procedures and to gain insight into the rigorous quality control programme that encompassed all phases of the survey. In this 4th cycle, the TALIS programme has been extended to also include the Starting Strong Teaching and Learning International Survey (TALIS Starting Strong), collecting data from leaders and staff in early childhood education and care (ECEC) settings. A second and new component under the umbrella of TALIS 2024 was introduced as the Teacher Knowledge Survey (TKS), focused on collecting information on the general pedagogical knowledge (GPK) of teachers in lower secondary schools.

TALIS is the first international series of surveys to focus on the learning environment and the working conditions of teachers in schools, offering teachers and principals the opportunity to provide their perspectives on school contexts. Countries can then use this information to deepen analysis of the questions TALIS examines and to aid the development of policy relating to these matters. TALIS data also allow countries to identify other countries facing similar challenges and learn from their approaches to policy development.

The first TALIS cycle in 2008 included 24 countries/territories and contributed significantly to teacher policy development. Its success led to a second cycle in 2013, with 34 participants. Four additional countries/territories joined on a delayed schedule in 2014, following the same procedures to ensure comparability.

From the start, TALIS focused on teachers in lower secondary schools – level 2 in the International Standard Classification of Education (ISCED) (UNESCO-UIS, 2012<sup>[1]</sup>). Starting in 2013, the possibility was given to countries to also survey teachers in ISCED levels 1 (primary) and 3 (upper secondary), and participate in the “TALIS-PISA link”, using the same schools as the OECD 2012 Programme for International Student Assessment (PISA). In 2013, six countries chose ISCED level 1, ten chose level 3 and eight opted for the TALIS-PISA link.

Following the 2008 and 2013 cycles, the TALIS Board of Participating Countries (BPC) – now the TALIS Governing Board (TGB) – launched a third cycle (TALIS 2018) from 2015 to 2019. Data collection occurred in late 2017 (southern hemisphere) and early 2018 (northern hemisphere).

In total, 48 countries/territories participated in TALIS 2018, again focusing on ISCED level 2 teachers and leaders. Countries could once more elect to include levels 1 and/or 3, and those also in PISA 2018 had the option of the TALIS-PISA link. Fifteen chose ISCED level 1, 11 chose ISCED level 3, and 9 used the link.

The first cycle of TALIS Starting Strong was also conducted in 2018, surveying leaders and staff in ECEC settings in ISCED level 02 (pre-primary education) in nine countries/territories. Four countries/territories conducted the survey in ECEC settings for children under the age of three (U3).

In 2024 TALIS is best understood as an umbrella programme for surveying:

- ISCED level 2 teachers and principals (optionally, ISCED level 1 and 3 teachers and principals), under the so-called TALIS core survey.
- leaders and staff in ECEC settings working with children at ISCED level 02 and leaders and staff working with U3 children, under TALIS Starting Strong.
- ISCED level 2 teachers participating in the TKS.

Following the design of TALIS 2024, three conceptual frameworks have been developed, outlining the concepts and indicators used in the three modules of the TALIS programme (OECD, 2025<sup>[2]</sup>; 2025<sup>[3]</sup>). These frameworks:

- The TALIS core conceptual framework (OECD, 2025<sup>[4]</sup>) covers teachers and principals at ISCED levels 1, 2 and 3 in the following areas:
  - the institutional environment
  - characteristics and qualities of teachers and principals
  - teachers' and principals' beliefs, perceptions and practices
  - the intersection of various themes at both the institutional and teacher levels
  - background information for teachers, principals and schools.
- The TALIS Starting Strong conceptual framework (ISCED level 02 and settings for U3 children) includes the following concepts and indicators:
  - process quality
  - monitoring children's development, well-being and learning
  - professional beliefs about children's development, well-being and learning
  - self-efficacy
  - staff and leader demographic and education background
  - professional development
  - well-being
  - structural quality
  - pedagogical and administrative leadership
  - organisational climate and working conditions
  - stakeholder relations
  - diversity, equity and inclusion in ECEC settings
  - approaches to comprehensive/continuous child supports
  - fostering competent ECEC settings
  - digital technologies.
- The TKS conceptual framework (ISCED level 2) describes the conceptual development of the assessment used to measure teachers' GPK, a construct that can be described across the following three dimensions with sub-dimensions:
  - Instruction
    - teaching methods and lesson planning
    - classroom management.
  - Learning
    - learning and development
    - motivational-affective dispositions.
  - Assessment
    - evaluation and diagnostic procedures
    - data literacy, interpretation and use.

Each TKS item is aligned to a dimension and sub-dimension of the conceptual framework, as well as to one of three cross-cutting categories: cognitive demand (recall, analyse or apply); knowledge base (theoretical/scientific, practice-based); and thematic orientation (core knowledge, emergent priorities for teacher knowledge).



This technical report is complimentary to the three conceptual frameworks, and readers are strongly encouraged to review their key aspects before reading this report.

Online data collection is the default mode for all TALIS 2024 modules. Forty-four of the 56 participating countries/territories<sup>1</sup> decided to collect TALIS data online, 11 participants collected data on line but also prepared paper instruments on request or as a fall-back option in parallel and 1 participant opted for the paper-and-pencil-only data collection mode.

The following sections of this chapter provide an overview of the management structure of TALIS 2024 at the international and national levels and outline the survey's three major phases and milestones.

## 1.2. Participating countries and territories

The following table (Table 1.1) lists the TALIS 2024 participants for all target populations.

**Table 1.1. TALIS 2024 participants at ISCED level 2, ISCED levels 1 and 3, the TKS and TALIS Starting Strong ISCED 02 and U3**

| Country/territory           | ISCED level 2 | ISCED level 1 | ISCED level 3 | TKS | TALIS Starting Strong ISCED level 02 | TALIS Starting StrongU3 |
|-----------------------------|---------------|---------------|---------------|-----|--------------------------------------|-------------------------|
| Albania                     | •             |               |               |     |                                      |                         |
| Alberta (Canada)            | •             |               |               |     |                                      |                         |
| Australia                   | •             | •             |               |     |                                      |                         |
| Austria                     | •             |               |               |     |                                      |                         |
| Azerbaijan                  | •             |               |               |     |                                      |                         |
| Bahrain                     | •             |               |               |     |                                      |                         |
| Brazil                      | •             | •             |               |     |                                      |                         |
| Bulgaria                    | •             |               |               |     |                                      |                         |
| Chile                       | •             |               |               | •   | •                                    |                         |
| Colombia                    | •             |               |               |     | •                                    |                         |
| Costa Rica                  | •             |               |               |     |                                      |                         |
| Croatia                     | •             |               | •             | •   |                                      |                         |
| Cyprus                      | •             |               |               |     |                                      |                         |
| Czechia                     | •             |               |               |     |                                      |                         |
| Denmark                     | •             |               | •             |     | •                                    |                         |
| Estonia                     | •             |               |               |     |                                      |                         |
| Finland                     | •             |               |               |     | •                                    |                         |
| Flemish Community (Belgium) | •             | •             | •             |     | •                                    | •                       |
| France                      | •             | •             |               |     |                                      |                         |
| French Community (Belgium)  | •             | •             |               |     |                                      |                         |
| Germany                     |               |               |               |     | •                                    | •                       |
| Hungary                     | •             |               |               |     |                                      |                         |
| Iceland                     | •             |               |               |     |                                      |                         |
| Ireland                     |               |               |               |     | •                                    | •                       |
| Israel                      | •             |               |               |     | •                                    | •                       |
| Italy                       | •             |               |               |     |                                      |                         |

| Country/territory      | ISCED level 2 | ISCED level 1 | ISCED level 3 | TKS | TALIS Starting Strong<br>ISCED level 02 | TALIS Starting StrongU3 |
|------------------------|---------------|---------------|---------------|-----|-----------------------------------------|-------------------------|
| Japan                  | •             | •             |               |     | •                                       |                         |
| Kazakhstan             | •             |               |               |     |                                         |                         |
| Korea                  | •             | •             |               |     |                                         |                         |
| Kosovo                 | •             |               |               |     |                                         |                         |
| Latvia                 | •             |               |               |     |                                         |                         |
| Lithuania              | •             |               |               |     |                                         |                         |
| Malta                  | •             |               |               |     |                                         |                         |
| Montenegro             | •             |               |               |     |                                         |                         |
| Morocco                | •             | •             |               | •   | •                                       |                         |
| Netherlands            | •             | •             |               |     |                                         |                         |
| New Brunswick (Canada) |               |               |               |     |                                         | •                       |
| New Zealand            | •             | •             |               |     | •                                       | •                       |
| North Macedonia        | •             |               |               |     |                                         |                         |
| Norway                 | •             |               |               |     | •                                       | •                       |
| Poland                 | •             |               |               | •   |                                         |                         |
| Portugal*              | •             |               | •             | •   |                                         |                         |
| Quebec (Canada)        |               |               |               |     |                                         | •                       |
| Romania                | •             |               |               |     |                                         |                         |
| Saudi Arabia           | •             | •             | •             | •   |                                         |                         |
| Serbia                 | •             |               |               |     |                                         |                         |
| Shanghai (China)       | •             |               |               |     |                                         |                         |
| Singapore              | •             |               |               |     |                                         |                         |
| Slovak Republic        | •             |               |               |     |                                         |                         |
| Slovenia               | •             | •             | •             |     |                                         |                         |
| South Africa           | •             |               |               | •   |                                         |                         |
| Spain                  | •             | •             |               |     | •                                       |                         |
| Sweden                 | •             |               |               |     | •                                       |                         |
| Türkiye                | •             | •             | •             |     | •                                       |                         |
| United Arab Emirates   | •             | •             | •             |     |                                         |                         |
| United States          | •             |               |               | •   |                                         |                         |
| Uzbekistan             | •             |               |               |     |                                         |                         |
| Viet Nam               | •             |               |               |     |                                         |                         |

### 1.3. Managing the survey internationally

In June 2021, the OECD established a partnership with the International Association for the Evaluation of Educational Achievement (IEA) and its consortium partners: the Australian Council for Educational Research (ACER, Melbourne, Australia), cApStAn Linguistic Quality Control (Brussels, Belgium) and RAND Europe (Cambridge, United Kingdom). As part of this collaboration, the OECD commissioned the IEA Hamburg office to serve as the international study centre (ISC) for the implementation of TALIS 2024. The consortium comprised staff from both IEA offices in Amsterdam and Hamburg, as well as from ACER, cApStAn and RAND.<sup>2</sup>

The ISC team was led by Steffen Knoll and Anja Waschk (Co-Directors), with Ralph Carstens serving as Senior Strategic Advisor and Lead for Conceptual Development, and Eleonora Kolomiets acting as Study Coordinator since 2022. The role of International Data Manager was held by Adriana Viteri, who assumed the position in 2021.

The IEA sampling team was led by Karsten Penon (Sampling Manager), responsible for the survey's international sample design and its national sampling plans, implementation, weighting and adjudication for all countries/territories and target populations. The analysis team at IEA Hamburg, led by Mojca Rožman since 2022, oversaw data scaling, table review and the review of the international report.

This team developed and implemented validation and scaling procedures, produced the scale scores for the TALIS core survey, including ISCED levels 1 and 3, and TALIS Starting Strong. They also collaborated with the ACER analysis team, which was responsible for the conceptual development of the TKS, as well as the analysis and scaling of TKS data. The IEA StudyExpert team led by Guido Martin was responsible for the development and administration of IEA StudyExpert software used for adaptation, translation and layout implementation and provision of the TALIS questionnaires on line. The development of the IEA's Data Management Expert, its Data Processing Expert, its Windows Within-School Sampling Software (WinW3S) and its International Database Analyzer was overseen and co-ordinated by Meng Xue (Senior Advisor, Unit Head) and Yasin Afana (Research Analyst).

At IEA Amsterdam, IEA financial director Jan-Peter Broek (since 2023) managed the financial and contractual affairs in co-operation with Christian Groth, Deputy Director and Head of Accounting and Controlling at IEA Hamburg.

David Ebbs (Senior Research Officer) led the translation verification of the national questionnaires in 74 language versions. Lauren Musu (Head of Translation Verification and Quality Control) was responsible for managing the international quality observation programme in all participating countries/territories by contracting, training and supervising independent quality observers.

Consortium member cApStAn Linguistic Quality Control, specialising in semantic quality control of translations in a range of international surveys and based in Brussels, Belgium, was responsible for conducting translation verification for all language versions. Josiane Tyburn (Lead Project Manager) co-ordinated the training of translation verifiers, the translation verification process and linguistic quality control. Steve Dept (founding partner, cApStAn) was responsible for the conceptual planning and implementation of the translation verification methodology.

The consortium member and project team at ACER was led by Wolfram Schulz (Framework Lead and Project Lead since 2023) who co-operated with John Ainley (Framework Lead) on framework development for TALIS core survey and the TKS. Pina Tarricone, in collaboration with Jonathan Heard and Wolfram Schulz, co-ordinated the TKS test development and scaling.

Miriam Broeks (Senior Analyst and Project Lead until 2022) followed by Marilyn Groom (Research Analyst and Project Lead since 2022) at RAND Europe (Cambridge, United Kingdom) co-ordinated the conceptual framework and questionnaire development of TALIS Starting Strong. Marilyn Groom was supported by Miguel Subosa (Research Analyst, RAND Europe). Lynn Karoly (Senior Economist and Professor of Policy Analysis, RAND School of Public Policy, United States) chaired the TALIS Starting Strong framework and questionnaire development group and filled an advisory role in collaboration with the consortium partners at RAND Europe.

The study's sampling referee, Jean Dumais (previously Statistics Canada, Gatineau, Canada), advised on sampling methodology, adjudication and non-response bias analyses and interpretation of results.

The ISC appointed Michèle Ernst Stähli (Swiss Centre of Expertise in the Social Sciences, Switzerland) as translation referee, who supported the ISC with her linguistic and methodological expertise in decision making related to translation and translation verification disparities.

The OECD Secretariat's Directorate for Education and Skills in Paris, France, responsible for the overall supervision of the project across the participating countries/territories and TALIS governing bodies, was led by Ruochen Li (Senior Project Lead), Gabor Fülöp (Analyst, TALIS core survey), Stéphanie Jamet (Senior Analyst, TALIS Starting Strong), Elizabeth Shuey (Analyst, TALIS Starting Strong), Marco Paccagnella (Analyst, TALIS TKS), Sophie Vayssettes (Analyst), Rodrigo Castaneda Valle (Analyst), Alison Burke (Analyst), Heewoon Bae (Analyst) and Rodolfo Ilizaliturri Lopez (Data Scientist).

The OECD Secretariat appointed Timothy Kennel (Assistant Division Chief United States Census Bureau, Washington, DC, United States) as chair of the TALIS 2024 Technical Advisory Group (TAG). Its task was to provide the OECD, the TALIS consortium and Questionnaire Expert Group with expert advice and guidance on methods, processes and analyses.

#### 1.4. Working with national project managers

In 2021, the TGB initiated the process of establishing national centres in each participating country or territory. Each centre was to be led by an experienced national project manager (NPM), who would be responsible for adhering to the consortium's guidelines regarding the roles and responsibilities of the NPM. The NPM held primary responsibility for preparing and co-ordinating the survey at the national level.

The specific allocation and management of tasks within each national centre were strongly influenced by the experience and expertise of the NPMs and their teams, particularly their involvement in other international large-scale assessments.

The consortium also recommended that each national centre appoint not only a national data manager (NDM) to oversee and implement technical and data-related activities, but also a national sampling manager (NSM) to assist the NPM in cases involving complex sample designs or potential national adaptations and extensions of the survey.

The number of staff members within each centre varied significantly across countries and territories, depending on their size and how they chose to organise the national data collection process. Several new and some late-joining TALIS participants required special attention, onboarding and ongoing support from the ISC.

In some cases, NPMs procured and contracted external survey organisations to support the scientific and/or operational aspects of the survey on behalf of their centres.

The tasks required of the NPMs, data managers and/or sampling managers included the following:

- establishing an overall preparation and administration schedule in co-operation with the ISC and discussing country or territory specific challenges or circumstances of the educational system
- attending NPM meetings in person and webinars hosted by the ISC to become familiar with all instruments, materials and survey procedures
- providing the IEA sampling team with an up-to-date national sampling frame of ISCED level 2 schools and, where applicable, ISCED levels 1 and 3 schools
- providing the IEA sampling team with an up-to-date national sampling frame with staff information of ECEC settings caring for ISCED level 02 children and, where applicable, staff information of settings working with U3 children at the age of under three years
- discussing national design options, such as oversampling, additional samples or sample adjustments for the field trial and main survey with the IEA sampling experts
- performing within-school listing, sampling and tracking of teachers and principals at schools, as well as of staff members and leaders at ECEC settings

- carrying out quality control and plausibility checks on teacher lists and samples to identify, for example, teacher lists that had been abbreviated to include only those teachers who had agreed to participate or lists that were otherwise incomplete/inaccurate; carrying out the same quality checks for ECEC settings, their staff and leaders
- appointing experienced translator(s) and translation reviewer(s) to prepare the national versions of the international instruments
- getting familiar with the adaptation and translation software IEA StudyExpert and documenting required national adaptations to and translations of the instruments using this software tool
- preparing for online data collection (unless opted out of)
- identifying and training school co-ordinators
- appointing and training national quality observers (NQOs)
- nominating possible international quality observers (IQOs) and supporting their work (main survey only)
- monitoring the return status of all questionnaires and projected response rates provided within *IEA StudyExpert* and *IEA's WinW3S software*
- capturing responses on paper manually and performing consistency checks
- completing a survey activities questionnaire (SAQ)
- submitting data and documentation to the consortium and responding to data queries during data processing and analysis.

Regular communication between the NPM and the ISC ensured that survey administration proceeded according to the international schedule. Deviating survey schedules were developed for two participants to accommodate their late joining and changes in the management and to ensure that their data could be included in the international database and reports. With minor exceptions, all participating countries or territories met the international collection milestones and submitted all data and documentation on time.

Countries in both the northern and southern hemispheres collected their TALIS data towards the end of the school year and in line with the TALIS 2024 Technical Standards (OECD, 2025<sup>[5]</sup>). However, to relax the very tight preparation timeline not only of the ISC but of southern hemisphere participants between the field trial and main survey, the TGB supported the idea to collect first northern hemisphere data between February and April 2024, followed by southern hemisphere data between June and August 2024. Prior to the data collection windows, national centres distributed login details to potential respondents, who then completed the questionnaires online within a defined survey window or, in selected cases, using paper questionnaires.

Experience from previous cycles of TALIS showed that the survey would be implemented on a voluntary basis in most instances. Twelve participating countries/territories made the participation mandatory for either sampled schools and the selected teachers and their principals or the sampled ECEC settings, their staff and leaders. When participation in the survey was voluntary, convincing schools or ECEC settings to participate in the survey proved to be a challenging exercise. Based on experience in previous TALIS cycles, the ISC discussed strategies and shared best practice examples with NPMs to support their efforts to achieve the required participation rates. National centres collaborated closely with teacher unions, principal associations, ECEC providers and organisations and relevant local, regional or national education authorities, including ministries of education where applicable, to gain endorsement for the survey and ensure broad participation. Additionally, participants conducted public relations campaigns to raise awareness among principals and teachers ahead of the main data collection phase. Many centres also developed dedicated TALIS websites to support their outreach and communication efforts.

The working language throughout the project was English, that is, for all international materials, communication and meetings. Email served as the primary mode of communication. For document and data exchange among all parties involved, the consortium employed Microsoft SharePoint as its collaboration platform. All systems were managed by the ISC, with access restricted to authorised personnel to maintain confidentiality and ensure data security.

Over the five-year survey cycle, the consortium organised four meetings for all NPMs and NDMs. Two meetings were held in person and two conducted as webinars. These meetings provided updates on survey progress and facilitated discussions on materials, procedures, technical standards and results. In addition to these gatherings, NPMs had both bilateral and plenary opportunities to share experiences and explore strategies for addressing challenges such as survey fatigue, maintaining confidentiality and managing international components alongside other concurrent surveys.

## 1.5. Standardised procedures

TALIS 2024 followed rigorous technical standards (OECD, 2025<sup>[5]</sup>) and procedures documented in five Survey Operations Procedures (SOP) units, the General Guidelines for National Project Managers, the School/Setting Co-ordinator Manual, the IEA StudyExpert Manual, the National Quality Observer Manual and practical guidelines outlining the tasks, procedures and activities for all participating countries/territories to successfully carry out the survey.

The TALIS 2024 Technical Standards, a continuation of the technical standards of three previous TALIS and the 2018 Starting Strong cycles, was developed by the consortium and endorsed by both the TGB and the TALIS Starting Strong Informal Group (IG). This document offered participants comprehensive guidance throughout all phases of survey implementation, from preparation and administration to data processing and analysis. The standards reflected widely recognised best practices in survey methodology – see, for example, Biemer and Lyber (2003<sup>[6]</sup>); Martin, Rust and Adams (1999<sup>[7]</sup>); OECD (2013<sup>[8]</sup>); and Statistics Canada (2009<sup>[9]</sup>) – and were aligned with the total survey error framework (Biemer and Lyber, 2003<sup>[6]</sup>). As the TKS was introduced as a new component in 2024, it required the development of dedicated technical standards. These standards were carefully formulated in collaboration with the OECD, participating countries/territories and the TAG, and subsequently implemented. Adherence to these standards was crucial to ensuring the validity, reliability and cross-national comparability of both the survey instruments and the data collected.

TALIS 2024 combined three survey modules under one umbrella: i) TALIS core survey (ISCED level 2) in schools with optional ISCED levels 1 and 3; ii) TALIS Starting Strong in ECEC settings, surveying staff and leaders at ISCED level 02 and for U3 children; and iii) the TKS with ISCED level 2 teachers in lower secondary schools. Table 1.2 provides an overview of the questionnaires prepared for each survey module.

The TALIS core survey administered a principal questionnaire and three versions of a teacher questionnaire at the respective ISCED level opted for by the country/territory. The TKS was conducted in the very same ISCED level 2 schools in which the TALIS core data collection took place. Therefore, the data linked to the same principal questionnaire could also be used as background data alongside TKS teacher data. Applying a rotated design in the TKS, four different booklets were administered, including a start section with questions from the core teacher questionnaire and a section with GPK questions to be completed by teachers within 24 hours.

With the agreement of the TGB and OECD Secretariat, the ISC provided the source versions of the questionnaires in English only, via newly developed software (IEA StudyExpert) designed to support instrument adaptation, translation into local language(s), layout preparation and all related verification processes (see Chapters 4 and 6). In the field trial phase, national centres adapted the instruments to their

specific contexts, following standardised adaptation guidelines. Once these adaptations were verified by the consortium, the national centres proceeded to translate the English source versions of the questionnaires into the respective local language(s).

**Table 1.2. Questionnaires prepared for TALIS core survey, TALIS Starting Strong and the TKS**

| Questionnaire | TALIS core survey<br>(ISCED level 2)<br>(optional ISCED levels 1 and 3) | TKS<br>(ISCED level 2)                                                                       | TALIS Starting Strong<br>(ISCED level 02 and<br>U3 children)                                                         |
|---------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Teacher       | Forms A, B, C<br>(for each ISCED level)                                 | Booklets 1, 2, 3, 4<br>(including background questions from<br>teacher questionnaire Form A) |                                                                                                                      |
| Principal     | 1 form per ISCED level                                                  |                                                                                              |                                                                                                                      |
| ECEC staff    |                                                                         |                                                                                              | 1 form for both ISCED level 02 and U3<br>children<br>1 Combined Questionnaire Main<br>1 Combined Questionnaire Short |
| ECEC leader   |                                                                         |                                                                                              | 1 form for both ISCED level 02 and U3<br>children<br>1 Combined Questionnaire Main<br>1 Combined Questionnaire Short |

Independent translation verifiers were employed to conduct international translation verification of all translated questionnaires and languages. The TALIS team at IEA Amsterdam, responsible for the overall co-ordination of the translation verification process, collaborated with cApStAn Linguistic Quality Control. cApStAn was in charge of training the translation verifiers and centrally co-ordinating the translation verification activities.

The IEA Hamburg sampling team performed all school- and ECEC-setting-related sampling and weighting procedures in line with established standards and guidelines (more details on the sampling procedures and sampling weights and participation rates appear in Chapters 5 and 9 respectively.) The TALIS NPMs used the IEA WinW3S software to draw the teacher or staff samples for each nationally sampled school or ECEC setting (as applicable) and to estimate participation rates.

IEA Amsterdam oversaw the quality monitoring of data collection at the international level, while NPMs were responsible for this task within their respective country or territory. IQOs participated in an intensive online training programme to prepare for their role (see Chapter 7).

After applying standardised processing and cleaning procedures to the data submitted by all participants, and once the TALIS consortium was satisfied that all data quality standards had been fully met, the data were recommended for inclusion in the TALIS 2024 databases and subsequent analytical reports.

However, if the consortium judged that certain standards had not been adequately met, an adjudication process was initiated in consultation with the OECD Secretariat and the TAG. This process assessed the extent to which data quality had been compromised and determined whether the data could be recommended for unconditional inclusion in the datasets and related reporting.

## 1.6. Key survey phases

The TALIS design followed three phases: a qualitative pilot, then a field trial and main survey, both involving all participants. Drawing on past cycles, countries were encouraged to form focus groups of teachers and principals (and ECEC staff for TALIS Starting Strong) to review field trial items for clarity and relevance (see Chapter 3). TKS focus groups also collected limited data and involved expert input.



To support preparation, the consortium held an onboarding session in June 2021 and a first NPM meeting in September 2021. This online meeting introduced the draft framework, sampling, timelines, operational procedures and roles. NPMs were also briefed on the overall TALIS 2024 timeline and best practices from previous cycles.

### **1.6.1. Pilot study**

The TALIS 2024 pilot study aimed to refine survey instruments for the field trial through qualitative assessment across ISCED levels 1 to 3 and TALIS Starting Strong. It included new, trend and refined items, focusing on clarity, relevance, feasibility and conceptual coverage. No national additions beyond mandatory adaptations were allowed.

The pilot evaluated how well teachers, principals and ECEC staff understood the items, reviewing aspects such as concept validity, complexity, item organisation, clarity, cultural relevance, translation issues and overall questionnaire flow and feel.

Paper-based surveys and structured feedback forms were used, prioritising qualitative input via focus groups. Translations, limited to mandatory elements, were reviewed internally by qualified translators and independent reviewers for accuracy and cultural fit, following technical guidelines.

NPMs recruited small, diverse focus groups (seven to nine participants) across ISCED levels and education types. Sessions (three to four hours) included individual completion and moderated group discussions. Moderators remained neutral and encouraged broad participation. Forty countries participated between 1 February and 15 March 2022, using in-person, online or hybrid formats. Feedback was submitted in English using structured forms and uploaded to SharePoint for evaluation by the ISC and expert groups.

A variant of the focus group approach was used for the TKS pilot, which focused on GPK among ISCED level 2 teachers. Alongside teacher feedback, an expert review used a National Expert Review Spreadsheet for item-level input. TKS materials were divided into Booklets A and B, including GPK and contextual questions. Unlike the TALIS core survey, TKS responses were entered in a Response Data Spreadsheet for further processing. Seven participants conducted the pilot from 1 to 28 February 2022, ending earlier to allow for timely analysis by ACER and the expert group.

### **1.6.2. Field trial**

The field trial had two goals: collecting large-scale data from all TALIS participants to refine survey instruments and testing operational procedures across countries to prepare for the main survey. These included sampling, instrument production, administration and data processing.

After the pilot, the ISC held online sessions with countries to discuss field trial schedules and participation strategies, while the IEA sampling team consulted on sampling frames and designs. The second NPM meeting took place in Hamburg (29-30 August 2022), followed by three-day data management training. Discussions covered pilot results, instrument changes, sampling plans and survey timelines. NPMs were introduced to the IEA StudyExpert software for instrument adaptation, translation and deployment, and tested its functionalities. Training also addressed data entry using ISC-provided software.

Three webinars supported implementation: one in September 2022 on IEA StudyExpert and two in December 2022 on within-school sampling for teachers and ECEC staff. All countries/territories conducted the field trial between 1 February and 31 March 2023, except two who followed a deferred schedule later in the year.

NPMs oversaw data collection, participation monitoring and, where needed, data entry. Most data were collected on line and stored on a secure German server managed by the ISC. For paper-based responses, countries entered and verified data before submitting to the ISC for final processing.

The IEA analysis team and expert groups (TALIS core survey, TALIS Starting Strong, TKS) analysed the field trial data, incorporating input from TAG, the OECD Secretariat and the TGB to improve the instruments. Revised versions were released for final translation in September 2023 (see Chapter 3).

### 1.6.3. Main survey

The main survey began with the third NPM meeting in September 2023 in Ljubljana, Slovenia. It aimed to prepare NPMs and NDMs for survey implementation, building on field trial results. Discussions included sampling strategies, survey operations and consultations on field trial data. The meeting also introduced international and national quality control procedures (see Chapter 7), with external observers involved at the international level, unlike the field trial.

Northern hemisphere participants conducted the survey between February and April 2024, with some extending towards the end of the second quarter of the year. The final submission deadline was end of May 2024. Southern hemisphere participants collected data from June to August, with a few continuing into September.

The ISC processed and cleaned the data, while IEA applied weighting, incorporating non-response bias analyses from countries that did not meet minimum participation thresholds. A staggered approach was applied: TALIS core data were processed first, followed by TALIS Starting Strong, then the TKS. An adjudication meeting was held in Hamburg in November 2024 with key stakeholders; a virtual follow-up in December finalised the process.

The fourth NPM meeting took place online in February 2025. It reviewed survey implementation, previewed international reporting tools and gathered feedback to inform future TALIS cycles.

In May 2025, a four-day in-person data analysis workshop in Hamburg trained around 100 representatives from participating countries/territories. It focused on using international databases, applying weights and scales and replicating analyses from the international report to support national-level reporting.

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## Notes

<sup>1</sup> Throughout the report, we will refer to 56 countries/territories and 1 country that participated through the IEA. The Belgium Flemish and French Communities have been administered as two different territories with two NPMs. Data were collected for Belgium as a whole and can also be analysed for the two territories.

<sup>2</sup> Refer to Annex A of this report for a complete list of previous and current staff that contributed to TALIS 2024.

## 2 Development of the conceptual frameworks

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This chapter outlines the development and refinement of the conceptual frameworks that guided the design of OECD Teaching and Learning International Survey (TALIS) 2024 across its three modules: the TALIS core survey, TALIS Starting Strong and the Teacher Knowledge Survey (TKS). It begins by describing a strategic concept paper that drew upon contemporary research and international policy priorities and introduced both enduring themes and emerging issues. The concept paper constituted the groundwork for subsequent development of the theoretical underpinnings in each framework, developed collaboratively by expert groups with diverse backgrounds and areas of specialisation. Key domains addressed across the modules included diversity and equity, the educational use of technology, and social-emotional learning. The frameworks also incorporate previously established dimensions of educational work such as professional development, occupational perceptions and institutional contexts.

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## 2.1. Introduction

This chapter describes the process of developing the conceptual underpinnings of the OECD Teaching and Learning International Survey (TALIS) 2024, including:

- the conceptual framework for the TALIS 2024 core survey (International Standard Classification of Education [ISCED] levels 1, 2 and 3) (OECD, 2025<sup>[1]</sup>)
- the conceptual framework for the Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) (OECD, 2025<sup>[2]</sup>)
- the conceptual and assessment framework for the Teacher Knowledge Survey (TKS) (OECD, 2025<sup>[3]</sup>).

The process began with the development of a concept paper that outlined the common and broad directions for the conceptual development of all survey components. This chapter describes, for each of the three frameworks, the general purpose and policy focus, the composition of expert groups and the development process and timelines. Full details on the conceptual orientation of each survey component are described in the respective framework.

## 2.2. Concept paper

The purpose of the TALIS 2024 concept paper was to explore the domains intended to be the focus of the TALIS core survey and its optional components, focused on early childhood education and care (TALIS Starting Strong), and teachers' general pedagogical knowledge (TKS). The concept paper reflected major concepts from the research literature, as well as policy interests, and was developed by researchers in consultation with international stakeholders and participating countries and territories. Three domains proposed for inclusion or further developed based on the underpinnings from 2018 in the survey reflected contemporary issues:

- diversity and equity
- educational uses of technology
- social-emotional learning.

Four of the domains were enduring teaching and learning issues:

- staffs' learning and development
- work practices
- occupational perceptions
- the institutional environments in which teaching and learning takes place.

The concept paper also identified the professional characteristics of staff who are assumed to be associated with those domains.

The development of the concept paper started in late 2020 and was a collaborative effort involving senior project staff from the International Association for the Evaluation of Educational Achievement (IEA), the Australian Council for Educational Research (ACER) and RAND Europe. It involved discussions with experts from different institutions to help assist with the identification of relevant policy issues and educational foresight.<sup>1</sup> A first draft was presented to the TALIS Governing Board (TGB) in March 2021 and included a preliminary outline of domains for assessment and initial considerations for instrument development.

Following feedback from country/territory representatives and experts, a revised draft was presented to the members of the TGB in September 2021. It was approved as a basis for the further development of the individual conceptual frameworks.

The final concept paper consisted of the following sections:

- relevant policy issues and educational foresight
- the strategic relevance of TALIS as an evolving survey programme
- exploring potential content areas for TALIS 2024
- content issues for the study of early childhood education and care (ECEC)
- developing an assessment of teachers' general pedagogical knowledge (GPK)
- a brief overview of implementation issues relevant to the conceptual framing.

As a scoping and staging document, the concept paper was for official use by the survey's governing bodies and was not made publicly available.

## 2.3. Conceptual framework for the TALIS 2024 core survey

### 2.3.1. General purpose of TALIS and its policy focus for 2024

TALIS was initiated with the aim of providing information on specified aspects of teaching and learning at the international and national levels. This is achieved through a series of surveys of teachers and school leaders focused on lower secondary education (ISCED level 2), with options for primary (ISCED level 1) and upper secondary (ISCED level 3) education. The first three cycles of TALIS were conducted in 2008, 2013 and 2018. TALIS 2024 represents the fourth iteration of the survey programme.

The general purpose of TALIS over time is to support participating countries and territories through the provision of robust information on the development of teaching as a profession, the review and development of pedagogical practices and the comparison of educational policies and approaches across contexts. TALIS generates reliable indicators of teachers, school leaders and teaching that allow valid international comparisons and perspectives on changes or consistencies over time. The analyses of these indicators are linked to educational policies and practices and are primarily oriented to the following groups of stakeholders:

- policy makers, to help them review and develop policies that promote the teaching profession and the best conditions for effective teaching and learning
- teachers, school leaders and education practitioners to facilitate reflections on, and discussions of, educational practices and how those practices might be enhanced
- researchers, to build upon past research literature on each content area (as identified in a conceptual framework) and provide bases for further research using TALIS and other data.

Each cycle of TALIS has built on previous cycles with a focus on the variation in instructional and institutional conditions enhancing student learning both within and across countries and territories, as well as over time. However, each new TALIS cycle also considers recent developments and includes new material to remain relevant in the face of emerging policy interests. Consequently, there is a considerable challenge for TALIS to sustain a core focus on enduring constructs (thereby providing a basis for measuring change) while incorporating emerging policy interests.

New material can take the form of new content or new aspects of existing content. For example, in TALIS 2018, content concerned with innovation as well as equity and diversity aspects were introduced. These linked to discussions about the shifting landscape of education from traditional subject matter towards the development of social-emotional and life skills. TALIS 2018 also expanded the topic of job satisfaction to

include teacher well-being through items concerned with workplace stress and retention, and it re-oriented the topic of school leadership to reflect new conceptions of that construct (Ainley and Carstens, 2018).

Content selected for inclusion in TALIS 2024 matched the following criteria (Ainley and Carstens, 2018<sup>[4]</sup>). It should:

- be policy-relevant in terms of international as well as national perspectives.
- add value for participating countries and territories.
- be possible to derive valid, reliable, comparable, robust and interpretable indicators of conditions for teaching and learning.
- include measurable aspects that can be assessed in a timely and cost-effective way.

### **2.3.2. The Questionnaire Expert Group: Role, membership and collaboration**

As in previous cycles, an expert group was established to assist with the development of the conceptual underpinnings of TALIS questionnaire materials and possible indicators. Membership of the Questionnaire Expert Group for TALIS 2024 is based upon:

- being deeply familiar with two or more key content areas
- ideally having previously published research using TALIS data
- being an expert in survey methodology and especially questionnaire design in a multi-cultural and multi-lingual setting
- coming from geographically diverse regions that match, at least broadly, the diversity of countries and territories participating in the survey.

Each QEG member was assigned to one or more thematic groups where they served as either the lead or the support to the group. Each thematic group drafted proposals, which were then reviewed by all QEG members and especially the chair. When the group met, all QEG members held equal weight in meeting discussions and recommendations. In addition to considering the analytical and policy relevance of the group's proposals, QEG members were asked to consider different educational cultural contexts and applicability across ISCED levels 1, 2 and 3.

Heather Price, Research Manager at the Learning Policy Institute, United States (previously Associate Professor at Loyola University, Chicago, United States) served as QEG Chair. She further elaborated underpinnings and materials in the school leadership and school climate content areas.

The QEG for TALIS 2024 included the following education, policy and survey experts, listed with the thematic groups in which they worked:

- Charalambos Charalambous, Associate Professor, Department of Education, University of Cyprus, Cyprus.
  - Areas of expertise: teachers' work practices, teachers' learning and development.
- Tracy Durksen, Scientia Research Fellow and Senior Lecturer of Educational Psychology, University of New South Wales, Australia.
  - Areas of expertise: occupational perceptions, social and emotional learning.
- Hilary Hollingsworth, Principal Research Fellow, ACER, Australia.
  - Areas of expertise: teachers' learning and development.
- Stefan Johansson, Senior Lecturer and Associate Professor, Department of Education and Special Education, University of Gothenburg, Sweden.
  - Areas of expertise: teachers' learning and development, diversity and equity, contextual factors.



- Ridwan Maulana, Professor of Educational Sciences, University of Groningen, Netherlands.
  - Areas of expertise: occupational perceptions, school climate.
- Lorena Ortega, Assistant Professor, Centre for Advanced Research in Education (CIAE), University of Chile, Chile.
  - Areas of expertise: social and emotional learning, diversity and equity.
- Oren Pizmony-Levy, Associate Professor of International and Comparative Education, Teachers College, United States (from 2022).
  - Areas of expertise: environmental sustainability.
- Ronny Scherer, Professor, Centre for Educational Measurement (CEMO), University of Oslo, Norway.
  - Areas of expertise: teachers' work practices, technology in education.
- Anna Sun, Associate Professor, Department of Educational Leadership, Administration and Research, Rowan University, United States.
  - Areas of expertise: school leadership.
- Kristen Weatherby, Weatherby Education Studies, United Kingdom.
  - Areas of expertise: teachers' work practices, technology in education.

The membership of experts remained stable throughout the years of work.

The QEG included the following *ex officio* members:

- ACER: John Ainley and Wolfram Schulz, as co-leads for the framework development.
- IEA: Ralph Carstens, Steffen Knoll, Mojca Rožman, Megan Sim and Anja Waschk, as directors and co-ordinators at the international study centre.
- RAND Europe: Merrilyn Groom and Lynn Karoly, as liaisons to TALIS Starting Strong.
- OECD Secretariat: Heewoon Bae, Pablo Fraser, Gabor Fülöp and Ruochen Li.

### **2.3.3. Developing and refining the conceptual framework**

After receiving comments from TGB members in March 2021 on the draft concept paper, the international research consortium commenced work on the development of the TALIS 2024 framework in the following stages:

- A first draft document was circulated to the TGB for discussion mid-2021 and underwent further revisions following extensive feedback from stakeholders, including an informal priority rating exercise.
- A revised draft document was presented at TGB meetings in October 2021, which was followed by a further revision phase in light of comments from TGB members and discussions with contributing QEG members and OECD representatives.
- Progress reports and conceptual updates were provided as part of subsequent meetings of the TGB in July 2022 (after the pilot implementation, before the field trial), as well as in May and September of 2023 (after the field trial, prior to the main survey data collection). Additional content sections and descriptions requested, developed and discussed at these stages concerned environmental and sustainability education as well as aspects of artificial intelligence (AI) related to the educational use of technology.
- The final revision was undertaken following the TALIS 2024 field trial and the selection of item material for the main survey data collection, concerning aspects no longer included in the final instruments, harmonising the structure and style of presentation across content areas, literature

updates related to recent reports with TALIS data, and updating the overall description as well as design features to match the final data collection.

The final framework document includes the following sections:

- Section 1: The role and policy relevance of TALIS as an evolving study programme in light of previous cycles and content and indicator priorities for 2024.
- Section 2: Content of TALIS 2024 with descriptions of each enduring as well as contemporary content areas, as well as relevant contextual characteristics of schools and teachers.
- Section 3: The TALIS 2024 study design with brief descriptions of the sampling, instrument and operational design of the survey.

The conceptual framework describes the enduring features of teachers, teaching and learning that have been investigated over previous cycles of TALIS as including teachers' initial training professional learning throughout their careers and the climate of their schools. It further defines the focus on teachers' learning and development, teachers' work practices, occupational perceptions and institutional environments for learning.

The framework then identifies the contemporary issues that are investigated in TALIS 2024, including diversity and equity, the educational use of technology (including indicators on the use and views of AI tools by teachers and students), social and emotional learning of students, and environmental and sustainability education as issues affecting teachers' responsibilities and expectations as well as the work of education systems.

Importantly, the framework describes how TALIS cross-examines contemporary issues from the perspective of enduring features. For example, it raises the question about the impact of growing diversity on initial teacher education, or how school climate interacts with the use of technology.

## 2.4. Conceptual framework development for TALIS Starting Strong

### 2.4.1. General purpose of TALIS Starting Strong and policy focus for 2024

TALIS Starting Strong, which was first administered in 2018, represents an effort to expand the evidence base on ECEC. Continuing in 2024, TALIS Starting Strong sought to collect cross-sectional data at different time points regarding the characteristics of the ECEC workforce, the nature of the work performed by ECEC practitioners, and working conditions in ECEC settings across different countries and territories. Broadly speaking, the main policy issues for the 2024 cycle were as follows:

- ensuring quality and equity in learning and well-being for all children
- motivating, developing and retaining staff in the profession.

TALIS Starting Strong also aimed to elucidate factors that influence the quality of ECEC provision, namely: process quality (which includes children's interactions with staff as well as with the physical environment and materials, and with the larger community) and structural quality (which refers to factors such as class/playgroup size and ECEC staff training and qualifications). The 2018 cycle captured information on both process and structural quality, and the 2024 cycle continued to do so and expanded the conceptual breadth.

Like the 2018 cycle, TALIS Starting Strong 2024 also aimed to produce practitioner- and setting-level indicators to monitor ECEC systems. Furthermore, the 2024 cycle sought to compile a reliable, comparative database of within- and between-country data on: i) ECEC staff and leader characteristics; ii) pedagogical practices in ECEC settings; iii) professional practices in other aspects of ECEC practitioners' work; and iv) features of the environments where children are developing and learning.

Analyses aimed to identify associations across these data points, while also taking stock of contextual differences at the country/territory and setting levels. Ensuring that at least some indicators are comparable between time points and across education levels was also a priority for the 2024 cycle.

#### **2.4.2. The ECEC Questionnaire Expert Group: Role, membership and collaboration**

The ECEC QEG was established by RAND Europe in January 2021 in collaboration with the IEA and in consultation with the OECD Secretariat. Members provided direct input to and ongoing feedback on the conceptual framework. In addition, they were consulted throughout the development of survey questions and items.

ECEC QEG experts were identified through a multi-stage process, which began with a long list of potential experts identified by RAND Europe, in consultation with the OECD Secretariat and participating countries and territories. Ultimately, nine experts were nominated for the ECEC QEG, one serving as chair, three acting as members of the Core ECEC QEG and the remaining five constituting the Extended ECEC QEG, who would be available for ad hoc support.

Lynn Karoly, Senior Economist at RAND and Professor of Policy Analysis at the Pardee RAND Graduate School, served as the chair of the ECEC QEG.

The Core ECEC QEG included the following experts:

- Alejandra Cortázar, ECEC Researcher and Consultant, Chile.
- Mine Göl Güven, Associate Professor, Faculty of Education, Boğaziçi University, Türkiye.
- Thomas Moser, Professor of ECEC Research, National Centre for Learning Environment and Behavioural Research, University of Stavanger, Norway.

The Extended ECEC QEG consisted of the following experts:

- Rahel Dreyer, Professor of Education and Developmental Psychology of the First Years of Life, Alice Salomon University of Applied Sciences, Berlin, Germany.
- Maelis Karlsson Lohmander, Senior Lecturer, Department of Education, Communication, and Learning, University of Gothenburg, Sweden.
- Yumi Yodogawa, Associate Professor, Faculty of Education, Chiba University, Japan.
- Abbie Raikes, Director of the Center for Global Health and Development and Professor at the Department of Health Promotion, University of Nebraska Medical Center, United States.
- Julie Belanger, Director, Better Purpose, United Kingdom.

Meetings with the ECEC QEG began in January 2021 and were also attended by the following *ex officio* individuals:

- RAND Europe: Miriam Broeks, Merrillyn Groom and Miguel Subosa.
- IEA: Ralph Carstens, Steffen Knoll and Anja Waschk.
- OECD: Stéphanie Jamet and Elizabeth Shuey.

Heather Price, chair of the TALIS core survey QEG, additionally attended meetings and provided liaison to the parallel conceptual and instrument development for the TALIS core survey.

Members of the Core ECEC QEG were assigned to draft specific sections of the TALIS Starting Strong 2024 conceptual framework based on their respective specialities, in collaboration with RAND Europe and the OECD. Subsequent drafts were edited and updated by RAND Europe, with ongoing feedback from the Core and Extended ECEC QEGs, as well as the OECD Secretariat and the IEA.

### **2.4.3. Developing and refining the conceptual framework**

The TALIS Starting Strong 2024 conceptual framework laid out the theoretical and analytical foundation for the staff, leader and combined questionnaires, the latter administered to staff that also hold leadership positions and to single-staffed ECEC settings. As the second cycle of an existing survey, the conceptual framework of TALIS Starting Strong 2024 built on the framework used during the 2018 cycle (Sim et al., 2019<sup>[5]</sup>). Furthermore, findings from the 2018 cycle informed the selection of content areas that would be covered by the 2024 cycle. The 2018 and 2024 cycles largely addressed the same content areas – albeit with updated labelling in the latter – as well as three additional cross-cutting areas of growing priority: approaches to comprehensive/continuous child support; fostering competent ECEC settings; and digital technologies to support leaders and staff. The priority area diversity, equity and inclusion in ECEC settings carried over from the 2018 to 2024 cycle.

To ensure that TALIS Starting Strong 2024 remained policy-relevant, RAND Europe conducted an initial, targeted literature review spanning evidence that was published after 2018. This literature review sought to update the survey's theoretical underpinnings, as well as identify trends and new developments that needed to be considered in producing the 2024 cycle of the survey, as well as subsequent cycles.

The results of the targeted literature review were discussed in separate consultations with the ECEC QEG and the OECD ECEC Network, both of which were held in January 2021. Feedback obtained through these consultations helped refine the way priority areas were framed in the survey. For instance, these consultations established that participating countries and territories were interested in how ECEC practitioners use digital technology to facilitate their own learning and development, rather than how they use such technology in their interactions with children.

Following these consultations, the areas of growing priority were discussed, finalised and approved during the OECD ECEC Network meeting in March 2021. In these discussions, it was also agreed that the content areas covered in the 2018 cycle remained relevant in the 2024 cycle and, as such, should be measured in TALIS Starting Strong 2024.

Having identified areas of growing priority in previous discussions, participating countries and territories, alongside the OECD ECEC Network, ranked the said areas in order of importance, through a priority rating exercise held in May 2021. During this exercise, members were also asked to identify questions from the 2018 cycle that should be retained to enable trend analyses in the 2024 cycle. This exercise was open to all ECEC Network members and all confirmed participants in the 2024 cycle.

Seventeen stakeholders provided input on the areas of growing priority while 18 stakeholders rated the staff and leader survey questions, indicating whether a question was of high priority and whether a question should be kept the same, kept but modified, kept but considered low priority or dropped from the survey. Over 70% of questions in the staff questionnaire and 80% in the leader questionnaire were preferred by the group to be kept but modified, and 15% of questions from both questionnaires were deemed to be of high priority.

To develop a complete first draft of the framework echoing these priorities and interests, each member of the Core ECEC QEG was assigned specific sections based on their expertise, while RAND Europe wrote the introduction and developed the survey overview, in particular the conceptual mapping of content areas against Bronfenbrenner's ecological systems.

Subsequent drafts of the conceptual framework were iteratively produced, based on feedback from the OECD Secretariat, the ECEC QEG, the ECEC Network, the IEA and participating countries and territories. Consultations with the editors of the TALIS core survey conceptual framework ensured alignment and consistency.

Iterations of the conceptual framework draft were formally presented on the following occasions:

- 28th ECEC Network meeting in October 2021
- 10th TGB meeting in October 2021
- 1st meeting of the TALIS Starting Strong Informal Group (IG)
- 13th TGB meeting in July 2024.

The final TALIS Starting Strong 2024 conceptual framework document includes the following sections:

- Section 1: The role and policy relevance of TALIS Starting Strong as an evolving study.
- Section 2: The focus of TALIS Starting Strong 2024.
- Section 3: A closer look at content areas for TALIS Starting Strong 2024.
- Section 4: Design of TALIS Starting Strong 2024.

Across these sections, the conceptual framework presents the overarching goal of TALIS Starting Strong 2024 to inform policies that can support governments' and education systems' long-term objectives and strategies concerning ECEC. Furthermore, it highlights the central role of ECEC practitioners in children's experiences of ECEC provision. In line with this, the conceptual framework discusses the 2024 survey's underpinning content areas and lays out their theoretical grounding. The aforesaid content areas fall along four distinct themes, namely:

- staff practices with children
- ECEC staff and leader characteristics
- ECEC setting characteristics
- cross-cutting content areas, as follows:
  - diversity, equity and inclusion in ECEC settings
  - approaches to comprehensive/continuous child support
  - fostering competent ECEC settings
  - digital technologies to support leaders and staff.

In discussing these content areas, the conceptual framework also describes how TALIS Starting Strong 2024 builds on the 2018 survey, noting which areas have been retained from the previous cycle and how new areas expand on previous survey implementation. Moreover, the conceptual framework also lays out the survey design and methodology for TALIS Starting Strong 2024, detailing the sampling approach, target population and survey procedures.

## 2.5. Conceptual framework development for the Teacher Knowledge Survey

### 2.5.1. General purpose and policy focus of the TKS

General pedagogical knowledge (GPK) is considered a crucial element of teachers' professional competence, supporting the implementation of effective teaching practices to improve student outcomes. Despite its importance, there is limited understanding and indicators of teachers' strengths and weaknesses in terms of their GPK, and little is known on how it can be further developed.

The TKS module, introduced as an optional component in the 2024 cycle of TALIS, seeks to address this gap. It aims to provide a deeper insight into the nature and current levels of teachers' pedagogical knowledge and professional competence. The module, targeted at ISCED level 2 teachers working in schools participating in the TALIS core survey, has the potential to inform teacher policies by providing insights into:

- the breadth of teachers' current pedagogical knowledge base

- what teachers know about dealing with contemporary issues in teaching, such as teaching students with diverse backgrounds, understanding students' social-emotional learning needs or applying modern pedagogical approaches
- strategies for enhancing both initial teacher training and continuing professional development, to ensure teachers have a solid and relevant knowledge base aligned with national policy priorities.

### **2.5.2. The Teacher Knowledge Expert Group: Role, membership and functioning**

To support the development of the conceptual and assessment framework, and review the GPK item development process, the consortium established a Teacher Knowledge Expert Group (TKEG). In consultation with the OECD, ACER selected members of the TKEG among prominent researchers in the field of GPK. The group was established in May 2021 and included the following experts:

- Drew Gitomer, Professor, Rose and Nicholas DeMarzo Chair in Education, Graduate School of Education, Rutgers University, United States.
  - Areas of expertise: teacher knowledge, teaching quality, teacher evaluation.
- Charalambos Charalambous, Associate Professor, Department of Education, University of Cyprus, Cyprus.
  - Areas of expertise: teacher knowledge, teaching quality, educational effectiveness.
- Liina Malva, Lecturer of Special Education and Inclusive Education, School of Educational Sciences, Tallinn University, Estonia.
  - Areas of expertise: GPK, inclusive education, special education.

Meetings of the TKEG were also attended by the following *ex officio* members.

- ACER: Kerry Elliott (TKEG Liaison), Jonathan Heard (Deputy Project Lead since 2023), Hilary Hollingsworth (QEG Liaison), Juliette Mendelovits, Ray Peck (Test Development Lead), Wolfram Schulz (Project Lead since 2023), Pina Tarricone (TKS Project Lead 2021-23) and Adam Wardell (Test Development Team).
- IEA: Ralph Carstens, Steffen Knoll and Anja Waschk (Study Directors).
- OECD: Heewoon Bae (Analyst), Marco Paccagnella (Analyst) and Ruochen Li (TALIS Senior Project Manager).

Nine online meetings of the TKEG were held between June 2021 and December 2024. The TKEG provided expert advice on two complementary strands of the project: the development of the TKS conceptual and assessment framework and the development of the TKS assessment instruments (see Section 3.3).

The TKEG undertook several reviews of drafts of the TKS conceptual framework, providing editorial guidance to ACER, particularly around document structure and construct clarity. At times, individual members of the TKEG were engaged to draft sections of the framework relevant to their particular areas of expertise.

### **2.5.3. Developing and refining the conceptual and assessment framework**

The TKS conceptual and assessment framework formed the foundation for the development of the TKS instrument used in TALIS 2024. It strongly reflected the conceptual framework model of teachers' professional competence (Guerriero, 2017<sup>[6]</sup>), which was developed by the OECD's Centre for Educational Research and Innovation, and guided the development of the Innovative Teaching for Effective Learning (ITEL) project's piloting of an initial GPK/TKS instrument in 2016.

The document provided the conceptual rationale for the design of the TKS as a whole, encompassing the theoretical and analytical basis for the measurement of GPK as an aspect of teachers' professional



competence, as well as the rationale for the inclusion of relevant contextual questionnaire material relating to:

- teachers' opportunities to learn about pedagogy-related topics
- their affective-motivational characteristics
- their work practices, including their collaborative and teaching practices.

It also provided a structured breakdown of the construct of GPK, and specified the design, structure and methodology for its assessment. Links to existing research in the field and the emerging body of knowledge about the importance of GPK were also articulated, as well as research foci for the survey and assessment instruments and areas of policy interest.

A discussion paper, detailing the conceptual focus of the framework, was initially presented to the TKEG in early 2021 for their feedback and direction. This paper also detailed potential emergent themes for teacher knowledge that might provide some focus for the development of the instrument. These themes, which included technology in the classroom, student diversity and social and emotional learning, were drawn from those that informed the development of the ITEL 2016 pilot instrument as well as the contemporary issues impacting on teachers, teaching and learning being developed as part of the TALIS core survey framework.

An initial draft of the framework was then shared with the OECD mid-2021, reviewed and then presented to TGB representatives of the countries and territories participating in the TKS module for feedback. Members' feedback was collated, analysed and coded by the ACER team to identify key areas of further refinement. The draft framework and a summary of the more complex areas of feedback were then presented at the 3rd TKEG meeting in September 2021, to seek assistance and advice as to how to address these areas. A summary of the key areas of feedback and anticipated revisions was then submitted to countries and territories at a TKS webinar later that month.

Following an iterative process of revision by the ACER team, based on updated information from pilot and field trial and ongoing review of GPK research literature, drafts of the framework were developed in response to feedback from the TKEG, OECD representatives and TGB delegates. Each draft version of the framework was presented at the following occasions:

- 10th TGB meeting in October 2021
- TKS webinar in April 2022
- 11th TGB meeting in July 2022
- 13th TGB meeting in July 2024.

The final framework document includes the following sections:

- Section 1: The role and policy relevance of the TALIS TKS.
- Section 2: Teacher knowledge as an aspect of teacher's professional competence.
- Section 3: Measuring and assessing GPK.
- Section 4: Examining GPK in the context of teachers' professional competence.
- Section 5: The TALIS 2024 TKS design.

The framework describes how the TALIS 2024 TKS measures teachers' GPK within the context of other indicators of teachers' professional competence, such as their opportunities to learn about topics related to general pedagogy. It also explores the relationship between GPK and other aspects measured with the TALIS 2024 core survey instruments, including teachers' affective-motivational characteristics and work practices. The framework also identifies the emergent priorities for teacher knowledge that are investigated in the TKS instrument, including teaching diverse learners, using technology for teaching, supporting the social and emotional learning of students and developing 21st century thinking skills.



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## Note

<sup>1</sup> Educational foresight advice was provided by Amy Bellinger and Katie Godwin (Education Commission), A. Lin Goodwin (University of Hong Kong, China), Jaime Saveedra (World Bank), Ranjitsinh Disale (World Teacher Prize Winner 2021) and Andreas Schleicher (OECD).

# 3

## Instrument development

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This chapter outlines the multi-phased process undertaken to develop the instruments for the OECD Teaching and Learning International Survey (TALIS) 2024. All development work followed a theory-driven and collaborative approach to ensure conceptual robustness, indicator relevance and cross-cultural validity. The process also aimed to preserve trend comparability while responding to evolving policy interests. Three dedicated expert groups either actively developed or oversaw the design, testing and refinement of questions and items in consultation with participating countries/territories. The development encompassed pilot studies, field trials and detailed analyses to improve material quality and relevance to address the key content areas stipulated by the conceptual frameworks for both enduring as well as emerging topics. For the core survey, a rotated questionnaire design allowed broader content coverage while managing response burden. For TALIS Starting Strong, carefully designed combined questionnaires tailored for specific types of early childhood education and care settings. For the Teacher Knowledge Survey, established multi-matrix approaches to item and block design were used.

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### 3.1. Questionnaire development for the TALIS core survey

Since its inception in 2008, the OECD Teaching and Learning International Survey (TALIS) has aimed to produce valid, reliable and internationally comparable data and indicators that are relevant to school leaders, teachers and teaching, with an emphasis on those aspects that affect student learning. TALIS intends to bring the voices and concerns of teachers and school leaders to the table of policy makers. It designs questionnaires for cross-cultural comparisons, primarily focusing on lower secondary level (International Standard Classification of Education [ISCED] level 2). Since 2013, TALIS has also covered primary (ISCED level 1) and upper secondary (ISCED level 3) levels.

TALIS allows for broad insights into surveyed populations since it uses large, carefully chosen representative samples of schools and teachers as well as state-of-the-art methods of data collection and quantitative analysis. These approaches support conclusions about important associations between key factors that occur within and across countries and territories.

#### 3.1.1. General aims, principles and timeline

TALIS 2024, based on the three previous cycles, applied a set of key principles to its questionnaire development process, namely:

- theory-driven development guided by a conceptual framework (see Chapter 2)
- input from countries/territories into the selection of themes and issues to be covered by the survey
- extensive consultations with countries/territories and experts in the survey's corresponding thematic areas as well as experts in questionnaire and sample design
- retention of selected constructs, variables and measures from TALIS 2018 to allow analyses of changes across TALIS cycles
- improvements to questions and items as deemed appropriate and validated through comparative experiments
- trialling and addition of new question material to address contemporary topics of interests and emerging issues
- descriptions of the cross-cultural validity of measures.

Chapter 2 and the conceptual framework for the TALIS core survey provide further detailed accounts of the scoping, theoretical grounding, design principles, operationalisation of the content areas and questions relevant for TALIS 2024 and relative to the previous cycles, as well as criteria for forming indicators.

Since expanding TALIS to primary and upper secondary contexts at ISCED levels 1 and 3 as optional survey components, TALIS has used the same data collection instruments with minor contextual adjustments and, occasionally, additions for these levels. This approach enables TALIS to validly document variations in teacher practices and development not only across and within countries and territories but also, where applicable, across different levels of education. Additionally, it allows for the reliable tracking of changes over time in key aspects relating to teachers and their working environments.

The four cycles of TALIS to date have enabled countries and territories with consistent participation to track key issues and concerns related to teachers and teaching over time through trends analyses. Since much of the questionnaire development took place during the Coronavirus disease 2019 (COVID-19) pandemic, experts recognised that comparisons between the 2018 and 2024 cycles could help assess the impact of the pandemic on teachers, teaching and student learning. While no direct pandemic-related data were collected, many conceptual areas highlighted their relevance during and after the pandemic.

As described in Chapter 2, a Questionnaire Expert Group (QEG) was formed to develop the conceptual underpinnings of TALIS 2024 and its retained, revised and new question material. A chair participated in Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) meetings to align

concepts and measures where appropriate, considering the shared and distinct aspects of early-childhood and school-based formal education.

Throughout the development work between late 2020 and late 2023, QEG members proposed framework text, thematic descriptions, questions and indicators, which the chair presented to the TALIS Governing Board (TGB) at key milestones. TGB members provided feedback on the framework, themes and questionnaire design, fulfilling their role in advising and approving the work of the international research consortium.

Key meetings of the QEG occurred as follows:

- Late 2020 – Consultation and development of the QEG membership nominations; kick-off; concept paper development.
- April 2021 – 1st QEG meeting (virtual): overview of the project and general scope and aims for framework and instrument development.
- May 2021 – 2nd QEG meeting (virtual): agreement on questionnaire design principles and development of thematic area descriptions.
- June 2021 – 3rd QEG meeting (virtual; three days): presentation and discussion of thematic area concept notes; proposals for pilot materials.
- September 2021 – 4th QEG meeting (virtual; four days): discussion of draft question material for the pilot.
- July 2022: 5th QEG meeting (in-person, with hybrid option in Hamburg; three days): review of pilot results and draft selection for the field trial.
- July 2023: 6th QEG meeting (in-person, with hybrid option in Amsterdam; four days): review of field trial results and deliberations for main survey material revision and selection.

Several shorter virtual calls were held between major meetings to provide updates, discuss specific materials (e.g. situational judgement tasks) and review materials developed on alternative timelines, including environmental and sustainability education and the use of artificial intelligence (AI) in education.

### 3.1.2. Item development phases

After the 2018 cycle, TGB members prioritised conceptual areas for an expanded set of items and indicators while preserving key measures for trend analysis, especially in light of COVID-19. They emphasised maintaining a median response time of 45 minutes or less in the English version. For the first time in TALIS, the TGB endorsed the consortium's technical proposal for a rotated design, where not all items would be asked of all teachers, supported by extensive consultation with the Technical Advisory Group (TAG) and a simulation study conducted by the OECD Secretariat. The QEG aimed to validate 60-minutes of items for the main survey, with pilot and field trial testing approximately 80- and 75-minutes' worth of question materials respectively, allowing the removal of underperforming items.

Table 3.1 provides an overview of the three main phases of questionnaire development.

**Table 3.1. Item development phases**

|         | Pilot                                                 | Field trial                                                                                    | Main survey                |
|---------|-------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------|
| Purpose | Test new materials in preparation for the field trial | Refine and test materials for inclusion in the main survey.<br>Test all operational procedures | Collect data for reporting |
| Mode    | Paper only                                            | Online, paper as an option                                                                     |                            |

|               | Pilot                                                   | Field trial                                                                                                                | Main survey                                                                                                  |
|---------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Format        | Focus groups/retrospective think-aloud                  | Self-administration using mostly closed-ended formats with limited "Other, please specify" options to augment closed lists | Self-administration using closed formats (except for one open question on policy)                            |
| Scope         | Mostly new and revised materials                        | All materials (total of about 75 minutes), additionally limited experiments                                                | All final materials (target of 45 minutes per teacher, 60-70 minutes across all forms)                       |
| Design        | Teacher questionnaire: two forms to balance burden      | Teacher questionnaire: rotated design with three forms and analytical priorities (high/medium/low)                         | Teacher questionnaire: rotated design with three forms and three analytical priorities (common/standard/low) |
|               | Principal questionnaire: one version                    | Principal questionnaire: one version                                                                                       | Principal questionnaire: one version                                                                         |
| Translation   | Many/key languages; parallel translatability assessment | All main languages, supported by translation notes and glossary                                                            | All languages, supported by translation notes and glossary                                                   |
| Participation | Approximately 40 countries/territories                  | All countries/territories                                                                                                  |                                                                                                              |

### *Review of existing questions and instruments*

The QEG's first task was to review the current state of education research within their thematic areas. Based on these reviews, QEG members developed literature summaries, proposed new items and identified prior items for revision in line with the TGB's priority rating. Thematic groups also explored intersections between themes and thematic concepts. The results of this first task were presented in virtual meetings in mid-2021. In these meetings, all QEG members provided feedback on thematic scope and cross-cultural applicability. These reviews formed the foundation of the conceptual framework document.

As part of the first task, QEG members also carefully reviewed the TALIS 2018 questions and instruments, identifying items to retain for comparisons in 2024, remove due to obsolescence or low priority, and revise based on recent research and general trends in education.

#### *• Pilot study*

The QEG's second task was to develop new questions for piloting and recommend revisions to prior TALIS items as needed. New item development encouraged the adaptation of items already established in the literature, with particular attention to validation in more than one educational system and ideally across a multilingual space. QEG members were also encouraged to consider using, where appropriate, the bank of items from TALIS 2018 that performed well in the pilot and field trial but were dropped due to response time limitations and include them on that 45-minute survey, rather than conceptual defects. When adaptation was not possible, thematic groups developed new items with keen attention to the item design principles established for TALIS over time and/or used by other international educational survey standards.

Throughout the QEG meetings in 2021, the thematic groups presented research summaries about their theme and identified key concepts tied to the theme. Thematic groups presented mappings of those key concepts already measured in prior TALIS cycles and those that were not, then presented proposals for items related to those concepts to include in TALIS 2024. They identified which items to: i) keep from TALIS 2018 as trend measures; ii) revise from TALIS 2018; iii) drop from TALIS 2018; and iv) pilot as new items. Deliberations during the meetings refined the proposed items based on TALIS principles, survey methodology in general and overlap with other concepts proposed by other thematic teams. When prior research was inconclusive as to the approach to take in asking a question, the QEG developed multiple forms of the questions to test as experiments on different questionnaire ballots. Experimental questions tested variations in wording of the question stem and answer categories, survey placement and answer order effects.

The main purpose of the pilot in early 2022 was to test the understanding of the items by respondents, i.e. teachers and principals, in a large variety of national settings. The goal was to revise and select questions for the field trial based on: the analysis of the pilot outcomes that aimed to collect information on sufficient conceptual coverage from the perspectives of teachers and principals (since TALIS is seen as the “voice of teachers”); conceptual understanding and clarity; international and cultural applicability; continued feasibility of a common questionnaire for ISCED levels 1 and 3; and feasibility of new, modified or alternative formats of new and adapted items.

For the pilot, small focus groups of teachers and principals were recruited in a subset of countries/territories (see Chapter 6 for details) to participate in a retrospective think-aloud exercise. The aim was for participants to come from a variety of age, cultural, subject domain, level and gender contexts, among other criteria. The pilot was conducted using paper instruments only and there was no data entry work except for recording feedback in standardised forms. In preparation for the pilot, countries/territories adapted the international source instruments using national adaptation forms and translated materials. A glossary was provided to support this process and was thus initially also validated as part of this exercise. The work of the group moderators was guided by probing questions developed by the QEG. Upon completion, the International Association for the Evaluation of Educational Achievement (IEA) cleaned and prepared all of the pilot feedback in a consolidated database for use by the QEG.

The focus groups provided insights that would have been difficult or impossible to obtain without direct interaction with respondents. The pilot was also useful in getting a diverse range of perceptions. The QEG then analysed results within thematic groups, identifying items that worked well, needed improvement or were ineffective due to cross-cultural challenges, complexity or response burden. In addition, QEG members also assessed the amount of time required for different questions. For those items that could be improved, groups were asked to propose revisions for the field trial. For concepts that were tested in experiments, thematic groups summarised the differences in effectiveness between experimental configurations.

### *Field trial*

In preparation for the field trial, the QEG held its 5th meeting to review pilot results by theme, deciding which items to retain, revise or drop. QEG members collaborated to finalise field trial proposals and drafted the analytic possibilities for within-theme and cross-theme analysis based on the materials envisaged for the field trial to further develop the conceptual framework.

Results from the pilot’s experiments were reviewed and reduced to one option for the field trial. For prior TALIS 2018 items, if no substantial differences were observed between the revised and the original formats, the revised format was adopted. If substantial differences were observed, the QEG reverted to the TALIS 2018 format to prioritise trend comparison capability. For new items set up in experiments, the set that best performed moved onto the field trial questionnaires.

At this phase in the project, the need to include the environmental and sustainability education theme was made clear among the OECD Secretariat and TGB member countries, based on an organisation-wide initiative to be better aware of the educational relevance, policies and practices in schools. An additional QEG member was appointed to develop a summary of the research on the theme as well as new question material for the field trial based on existing and validated survey initiatives in this field.

The consortium determined the field trial design for the teacher questionnaire, balancing the number of items and length of the three planned forms. The presentation order of the themes on the questionnaires remained consistent across the forms, but the rate of inclusion of each question varied by priority: questions of high analytical priority for the field trial validation and breakdown of results appeared on all three forms, new and revised materials on two forms to yield a larger number of cases for validation, and unchanged materials from TALIS 2018 on just one of the three forms due to low analytical priority at the field trial stage.

The field trial was prepared in late 2022 and implemented in early 2023 across all countries and territories. The data collection mode was through online, self-administered questionnaires to a random sample of 30 schools and 20 teachers, plus 1 principal in each. Chapter 4 provides further details about adaptation and translation of international source versions to one or more national languages, Chapter 5 includes details about the sampling design for the field trial and Chapter 6 describes the field work of national project managers (NPMs) in each country/territory as well as the support provided by the international study centre.

Following the field trial data collection, the IEA cleaned and prepared all field trial data as well as descriptive statistics and extensive exploratory and (multi-group) confirmatory factor analyses to test existing, revised and new materials in terms of dimensionality and cross-cultural comparability of the proposed latent constructs. All field trial data and analysis results were then shared with the QEG members for their individual and joint review and evaluation.

### *Main survey*

After the field trial, the QEG analysed the results and data within thematic groups using the analyses provided by the consortium and their own modelling. The thematic groups identified well-functioning items, assessed revisions and flagged those lacking validity or reliability, especially in cross-cultural contexts. In addition, QEG members paid attention to the amount of time required for different questions. They also looked for evidence of stylistic responding and item non-response bias, including unusually high item skip/missingness and/or associated dropout from the survey. QEG members also noted the observed median timing of each question and sets. The thematic groups presented their analyses at the 6th QEG meeting, held in person in mid-2023.

Few question sets were deemed unsuitable for cross-cultural comparisons and, thus, recommended for exclusion from the main survey. Most question sets and items performed well. In the cases where new items were tested in question sets, the number of items were reduced for parsimony. Additional multi-group confirmatory factor analyses were conducted to determine which items to retain and which to drop in order to maintain maximum variability while maintaining cross-cultural comparability. There were no questions or items that invoked item non-response in any elevated or biased manner, nor any questions or items that led to respondents dropping out of the survey midway. Observed dropouts were linked to total time, such as reaching a 45- or 60-minute ceiling, potentially relative to time available during idle lessons, rather than any question or item content. Except for grammatical corrections, no changes in wording or format were allowed between the field trial and main survey. The 6th QEG meeting focused on reducing, removing or retaining item materials.

At the 6th QEG meeting, the rapid rise of ChatGPT and other generative AI tools available to educators and the general public prompted the OECD Secretariat to propose including some AI-related questions in the main survey. The QEG agreed that items that gauge observable behaviours, such as use of and familiarity with AI, would be less prone to cross-cultural misinterpretation errors than perceptual and belief-based items. The QEG's education technology group researched AI-related questions and proposed an initial set of items for the main survey. After further offline review, the final set of items on AI were vetted by the QEG, the OECD Secretariat and the consortium, and ultimately endorsed by the TGB as an exception to the otherwise long-standing principle that all materials had to be field trialled.

In parallel to the main survey preparations, QEG members reviewed and revised their thematic sections in the conceptual framework document. QEG members also reviewed, revised and verified the final construction, labelling and description of the scales set to be calculated from the main survey data collection.

In the 2013 and 2018 cycles, multiple forms were used at the pilot and field trial phases to balance response burden with the breadth of materials trialled. The 2024 cycle expanded the approach to the main survey



by using three partially overlapping forms for the teacher questionnaire. As outlined in the conceptual framework, the allocation was driven by a fixed sequence of questionnaire sections and three different analytical priorities. Questions required as essential socio-demographic measures or other outcomes of high relevance for cross-sectional or over-time analyses were included in all three forms as common questions. Most questions had standard priority, meaning that they were included in two rather than in all three forms. This resulted in some sections listing only the common questions, others not appearing at all on certain forms. Finally, questions with comparably lower analytical priority were included in only one of three forms.

In contrast to student assessments where items are largely interchangeable and organised in blocks and booklets, the degrees of the freedom to assemble and combine materials in a questionnaire survey such as TALIS are more limited. Sections vary in terms of question count, question type (e.g. a count versus Likert-type scales on perceptions), stem length, number of items and, thus, the predicted time needed to respond to questions. Additionally, linkages between the different content areas and their measures were largely driven by reporting plans, including correlational and multivariate analyses. The consortium, in close consultation with the QEG Chair, the OECD Secretariat and the TAG, balanced form length based on number of pages, number of questions, items and words, and field trial response times. Predicted response time differences of a few minutes were considered acceptable, prioritising conceptual and analytical consistency over strict timing uniformity.

Table 3.2 provides an overview of the resulting design of the main survey. The conceptual framework includes a full account of all questions and their allocation to the three forms. To note, a small number of questions allocated differently from the section-level design, and countries and territories could opt out agreed-upon optional questions.

**Table 3.2. Configuration of main survey teacher questionnaire sections across forms**

| Section/theme                | Number of questions | Number of common questions | Allocation of questions by section/theme |             |             |
|------------------------------|---------------------|----------------------------|------------------------------------------|-------------|-------------|
|                              |                     |                            | Form A                                   | Form B      | Form C      |
| Background and qualification | 8                   | 4                          | All                                      | All         | Common only |
| Current work                 | 8                   | 3                          | All                                      | All         | Common only |
| Professional learning        | 9                   | 2                          | Common only                              | All         | All         |
| Teaching in general          | 9                   | 2                          | Common only                              | All         | All         |
| AI in teaching               | 4                   | 0                          | All                                      | n/a         | n/a         |
| Education and sustainability | 7                   | 0                          | All                                      | n/a         | All         |
| Teaching in the target class | 16                  | 1                          | Common only                              | All         | All         |
| Situational judgement tasks  | 2                   | 0                          | n/a                                      | All         | n/a         |
| School climate               | 9                   | 1                          | All                                      | Common only | All         |
| Occupational perceptions     | 9                   | 2                          | All                                      | All         | Common only |
| Teacher mobility             | 3                   | 0                          | All                                      | n/a         | n/a         |
| <b>Total</b>                 | <b>84</b>           | <b>15</b>                  | <b>54</b>                                | <b>60</b>   | <b>58</b>   |

n/a: Not applicable.

### 3.2. Questionnaire development for TALIS Starting Strong

TALIS Starting Strong is a large-scale international survey of early childhood education and care (ECEC) staff and leaders working with children in pre-primary education settings and children under the age of three (U3). It aims to be internationally comparable and explores the quality of development, well-being

and learning environments in ECEC settings by asking ECEC practitioners about their pedagogical beliefs and practices, training and qualifications and working conditions.

### **3.2.1. General aims, principles and timeline**

On its second cycle, TALIS Starting Strong builds on findings and lessons learned from its first implementation in 2018, which demonstrated that an internationally comparable ECEC survey was feasible to implement and relevant for policy making. TALIS Starting Strong 2018 was implemented with nine countries, which surveyed ECEC practitioners working with children in pre-primary education (ISCED level 02). Of these nine countries, four also administered the survey with practitioners working with U3 children. To account for home-based and single-staffed settings, the 2018 cycle also implemented a combined questionnaire, targeted to these staff working alone. An additional version of the combined questionnaire was used for setting leaders who also regularly performed staff duties in one of the participating countries in 2018.

TALIS Starting Strong 2024 surveyed ECEC staff and leaders in more countries/territories than the 2018 cycle. Building on the 2018 cycle, TALIS Starting Strong 2024 sought to facilitate trend analyses and to refine, rather than redesign, the 2018 survey. Hence, TALIS Starting Strong 2024 continued to collect data from pre-primary ECEC practitioners and ECEC practitioners working with U3 children. In addition, the 2024 cycle still used three types of questionnaires – staff, leader and combined – with two versions of the combined questionnaire. One was administered in single-staffed settings (including home-based settings in the sample of settings for U3 children) while the other was administered in centres whose leaders also regularly perform staff duties.

Correspondingly, TALIS Starting Strong 2024 addressed largely the same content areas as the 2018 cycle, with updates for relevance and conciseness, as well as to better reflect the focus of the 2024 cycle. The content areas were grouped under four domains, as listed below:

- Staff practices with children:
  - process quality
  - monitoring children's development, well-being and learning
  - professional beliefs about children's development, well-being and learning
  - self-efficacy.
- Staff and leader characteristics:
  - staff and leader demographic and educational background
  - professional development
  - well-being.
- ECEC setting characteristics:
  - structural quality
  - pedagogical and administrative leadership
  - organisational climate and working conditions
  - stakeholder relations.
- Cross-cutting content areas:
  - diversity, equity and inclusion in ECEC settings
  - approaches to comprehensive/continuous child support
  - fostering competent ECEC settings
  - digital technologies to support leaders and staff.

In line with the TALIS core survey for ISCED level 2, TALIS Starting Strong 2024 adopts the following guiding principles:

- Key policy issues are clearly articulated, and questions that are most relevant for participating countries are the survey's focus.
- The study provides value through international comparisons.
- Results should generate information that can be used to develop indicators.
- Based on a rigorous review of the existing evidence, the survey should yield information that is valid, reliable and internationally comparable.
- Participating countries should be able to interpret results in a meaningful way.
- Developing and administering the survey should be implemented in a timely and cost-effective fashion.

The key stages and milestones for instrument development, especially ECEC QEG meetings, were as follows:

- January 2021: The ECEC QEG was established and a 1st on-boarding meeting (virtual) held (see Chapter 2 for membership information).
- March 2021: A 2nd meeting (virtual) was held to discuss experts' review of the themes and commence development of instruments for the pilot.
- May 2021: Countries/territories participated in a priority rating exercise, indicating which questions should be kept as is, kept but modified or dropped, along with their respective priority.
- June 2021: 3rd ECEC QEG meeting (virtual) to introduce and discuss materials for piloting and further revisions.
- September 2021: 4th ECEC QEG meeting convened to discuss revisions for the staff and leader questionnaires (virtual).
- May 2022: Following piloting, prospective revisions to the field trial questionnaires were discussed during the 5th ECEC QEG meeting (in-person).
- July 2023: Following the field trial, the 6th and final ECEC QEG meeting was convened to review, edit and provisionally finalise the staff, leader and combined questionnaires (in-person).

As in the case of the TALIS core survey, numerous shorter and virtual meetings took place to discuss specific aspects or topics for questionnaire development; these included discussions regarding overarching survey themes (e.g. process quality) or regarding specific questions and items (e.g. situational judgement tasks). Aligned with major development phases, stakeholder feedback was collected and comments sought from the informal group of countries and territories (IG) participating in TALIS Starting Strong during formal meetings and special sessions on separate occasions or in conjunction with the TGB meeting. Additionally, the consortium informed the NPMs at each meeting about the process and progress of framework and instrument development work in order to familiarise them with the envisaged materials, translation workload and guidance.

### **3.2.2. Item development phases**

#### *Review of existing questions and instruments*

In the interest of facilitating comparative trend analyses, the ECEC Network established, at its 27th meeting in March 2021, that TALIS Starting Strong 2024 should continue to collect data on the content areas covered by the 2018 cycle, alongside data on the identified areas of growing priority.

To identify which questions would be retained for the 2024 cycle's pilot phase, 18 stakeholders participated in a priority ranking exercise that asked to classify each question into 1 of 4 possible categories:

- keep with high priority
- keep with modifications
- keep with low priority
- drop.

Of the 46 questions included in this priority ranking exercise, 3 were deemed to be of low priority while only 1 was suggested for dropping from the questionnaire.

In addition, stakeholders were asked to rank-order the four areas of growing priority, with a rank of 1 representing the highest priority and 4, the lowest. Responses were collated to inform decision making regarding which questions and items would be retained for piloting.

Following this priority ranking exercise, annotated versions of the questionnaires were shared in advance with the ECEC QEG, identifying which questions warranted discussion. This series of deliberations resulted in pre-pilot questionnaire drafts, with questions mapped against their equivalent questions in the 2018 versions of the questionnaires, where applicable. In total, the pre-pilot staff questionnaire contained 48 questions while the pre-pilot leader questionnaire contained 38. These pre-pilot versions of the questionnaires were shared with OECD Secretariat for feedback, and changes were then presented to participating countries/territories followed by written feedback.

### *Pilot study*

The pilot for TALIS Starting Strong 2024 took place in 2022 and tested the full set of questionnaires (i.e. staff, leader and combined). Since TALIS Starting Strong targets ECEC practitioners across two education levels (i.e. ISCED level 02 and U3 children), the staff questionnaire had one version for each level, with slight variations to ensure applicability. Eleven countries and territories took part in the pilot study, in at least one level: Chile, Colombia, Denmark, the Flemish Community of Belgium, Germany, Ireland, Japan, Morocco, New Zealand, Norway and Spain.

NPMs in these countries/territories organised focus group discussions, which sought to collect feedback on the following issues:

- applicability of concepts
- complexity of the questionnaires
- organisation of topics and questions in the survey instruments
- applicability of questions to ISCED level 02 and U3 contexts
- international and local applicability of the survey instruments
- clarity of wording and definitions of terms
- cultural relevance and appropriateness
- mandatory national adaptations
- translation issues
- length of the survey instruments and response time.

To facilitate this process, NPMs brought together separate groups of ECEC staff to discuss the staff questionnaire, ECEC leaders to discuss the corresponding leader questionnaire and ECEC leaders who also performed staff duties to discuss the combined questionnaire.

Ahead of the focus group discussion, staff and leaders were provided with pen-and-paper versions of the survey. Staff and leaders were given around 60 minutes to complete the survey. In doing so, participants were requested to note down comments on the questions and items for discussion.

Focus group discussions were informed by a protocol and pre-specified guidelines co-developed by the consortium, the ECEC QEG and the OECD. These focus group discussions helped generate insights into survey design and administration that could only have surfaced through direct consultation with the intended respondent population.

The pilot was administered using only pen-and-paper instruments. No data entry work was conducted besides documenting feedback collected in focus group discussions. Feedback from the focus group discussions was collated by participating countries' respective NPMs, who recorded feedback by filling in an online questionnaire. In preparation for the pilot, the instruments were adapted to each participating country/territory using national adaptation forms and translated materials. To support this process, a glossary, which was validated beforehand, was also provided. Feedback collated from these focus group discussions informed subsequent reviews by the ECEC QEG and OECD. These subsequent rounds of review resulted in the finalisation of the questionnaires that would be tested during the field trial.

### *Field trial*

The field trial for TALIS Starting Strong 2024 took place in early 2023. It sought to test the psychometric properties of the questions, as well as the time burden on participants. Field trial data were collected through online, self-administered questionnaires. A total of 2 051 staff members across 436 ECEC settings at ISCED level 02 and 367 staff members across 77 ECEC settings at U3 level participated in the staff questionnaire field trial. On the other hand, 316 leaders in ECEC settings at ISCED level 02 and 38 leaders in ECEC settings at U3 level participated in the leader questionnaire field trial. Chapter 5 provides further details about the field trial sampling design while Chapter 6 lays out the survey administration procedures undertaken during the field trial.

The staff questionnaire appeared in separate ISCED level 02 and U3 versions while the leader and combined questionnaires had joint versions for both education levels. In preparation for the field trial, the survey instruments were adapted to and translated into the national languages of participating countries/territories, the process for which is described in Chapter 4.

The staff and leader questionnaires were released in two forms: A and B. These forms contained identical questions, except for variations in eight questions from the staff questionnaire and six questions from the leader questionnaire. Form A used one question variant while Form B used the other variant. In doing so, the field trial could test whether one question variant functioned better than the other and would therefore be a more suitable candidate for inclusion in the main survey.

In total, Forms A and B for both the ISCED level 02 and U3 versions of the staff questionnaire had 54 questions. On the other hand, the leader questionnaire – for which only one version was used for both ISCED level 02 and U3 survey respondents – had 44 questions in Form A and 46 questions in Form B, the difference explained by experiments involving additional questions in Form B.

After data collection, field trial data were cleaned and prepared for analysis. Analyses included calculation of descriptive statistics, as well as confirmatory factor analysis (CFA) and exploratory factor analysis (EFA) to test questions' dimensionality, as well as validity across cultures and age groups. The results of these analyses were shared with the OECD and members of the ECEC QEG to inform decision making on which questions would be retained for the main survey. This process is described in more detail in the sub-section that follows.

### *Main survey*

Using data from the field trial, descriptive statistics for each question and item were calculated, as well as psychometric properties for questions where scaled indices were planned. Response omission patterns, response distribution and time to answer were amongst the key descriptive statistics used in deliberations regarding exclusion or inclusion of questions and items in the main survey questionnaires. In addition, CFA

was conducted using field trial data to check the dimensionality of questions hypothesised to cluster together under given scales, including model fit and factor loadings. Scales that showed potential indications of multi-dimensionality based on 2018 data were also tested accordingly using EFA. Moreover, reliability, factor invariance and measurement invariance were tested for items hypothesised as forming scales.

Somewhat separately from the main analyses of field trial data described above, situational judgement test (SJT) items were examined using descriptive and correlational statistics. For instance, EFA was conducted to test SJT items' scale dimensionality. Applicability across age groups was also tested through item-rest correlations using raw scores and two scoring approaches laid out in the field trial analysis plan. Similarly, cross-cultural validity was tested by examining item-rest correlational patterns emerging from each country's/territory's dataset. Response omission patterns, response distributions and time to answer were also considered. All descriptive statistics, correlational patterns and psychometric analyses described above informed the decision-making process regarding which items would be retained in the questionnaires that would be used for the main survey. Statistical findings informed decision making around recommendations for each question. One of the following actions was recommended for each question:

- keep as is
- drop item(s)
- drop question
- discuss at meeting.

Ahead of convening the 6th ECEC QEG meeting, descriptive statistics, correlational patterns and psychometric analyses, alongside recommended actions for each question, were compiled and shared with the OECD and ECEC QEG members.

The 6th ECEC QEG meeting, which was attended by ECEC QEG members and representatives from the IEA, RAND and the OECD, took place in mid-2023. Each question used in the field trial, alongside its statistical properties, was presented and deliberated during this meeting, with a focus on questions recommended to be dropped or discussed. The meeting led to an agreement to move forward with only one version of the staff questionnaire applicable to both ISCED level 02 and U3, contrary to the two slightly different versions used during the field trial. Furthermore, two of the five SJTs tested during the field trial were selected for inclusion in the main survey staff questionnaire.

Resulting from deliberations during the 6th ECEC QEG meeting and subsequent discussions with relevant stakeholders, 49 questions were carried over into the main survey version of the staff questionnaire, 45 for the leader questionnaire, 67 for the Combined Questionnaire Main and 54 for the Combined Questionnaire Short.

### 3.3. Assessment and contextual questionnaire development for the Teacher Knowledge Survey

TALIS has, throughout its existence, sought to generate valid, internationally comparable information about teaching and teachers at the system, school and teacher levels, with an emphasis on aspects that can impact student learning. TALIS 2024 gave participating countries and territories the possibility to participate in the optional Teacher Knowledge Survey (TKS) module, aimed at assessing teachers' general pedagogical knowledge (GPK). GPK is defined as “[t]he specialised knowledge of teachers for creating effective teaching and learning environments for all students, independent of subject matter.” (OECD, 2025, p. 8<sub>[1]</sub>). The TKS includes a contextual questionnaire (largely overlapping the questionnaire used in the TALIS core survey) and an assessment of GPK. It complements the core survey and provides

opportunities to benchmark teachers' pedagogical knowledge at the international level and to study how teachers' background, context and system characteristics influence the acquisition and development of GPK.

### 3.3.1. General aims, principles and timeline

#### *General aims and principles*

The TKS built on assessment instruments originally developed by the OECD Centre for Educational Research and Innovation as part of the Innovative Teaching for Effective Learning (ITEL) project (Guerriero, 2017<sup>[2]</sup>). In 2016, a pilot study was conducted in five countries/territories to assess the feasibility of measuring teachers' GPK (Sonmark et al., 2017<sup>[3]</sup>). As it is theorised that teachers' GPK is a determinant of teaching quality and an important aspect of teachers' professional competence more broadly (OECD, 2025), the inclusion of an instrument measuring the level of teachers' GPK in a representative sample of schools provides policy makers in participating countries/territories useful additional insights, such as examining the relationship between teachers' GPK and other important areas of policy concern, including initial teacher education and continuous professional learning, teachers' occupational perceptions and the quality of their teaching practices.

The GPK items were developed with reference to the TKS assessment framework and mapped to the three dimensions (and six sub-dimensions) of GPK (see framework for full details):

- Instruction
  - teaching methods and lesson planning
  - classroom management.
- Learning
  - learning and development
  - motivational-affective dispositions.
- Assessment
  - evaluation and diagnostic procedures
  - data literacy, interpretation and use.

Items were also mapped to three cross-cutting categories:

- Cognitive demand
  - recall
  - analyse or apply.
- Knowledge base
  - theoretical/scientific
  - practice-based.
- Thematic orientation
  - core knowledge
  - emergent priorities for teacher knowledge.

Items mapped to the category related to emergent priorities for teacher knowledge included those that addressed GPK in relation to teaching diverse learners, using technology for teaching, supporting social and emotional learning and developing 21st century thinking skills. These themes were identified based on a review of themes developed in the ITTEL pilot study, alignment with the contemporary issues impacting



teachers, teaching and learning identified in the TALIS core survey, and consultation with TKS participant countries/territories in May 2021.

All TKS items were in selected response format: either as four-option simple multiple-choice (SMC) questions or as two-option complex multiple-choice (CMC) questions consisting of between three and five items. Limitations on a reasonable response time and constraints on resources for coding prevented constructed-response items being included in the TALIS 2024 TKS.

Much like the TALIS core survey, the development of the TKS instrument followed a set of key principles:

- a theory-driven development guided by a conceptual framework (see Chapter 2)
- input from participating countries/territories in the development of thematic foci and priorities, the selection of items and the balance of items by GPK dimension/sub-dimension and the cross-cutting categories for the main survey blueprint
- extensive consultations with experts in pedagogical knowledge as well as technical experts in assessment design
- adherence (where possible) to the original ITEL pilot study instrument design while maximising synergies with the TALIS 2024 core survey questionnaire material
- improvements to and selection of items based on qualitative feedback and psychometric analysis
- attention to the cross-cultural validity of measures
- maximising the number of score points and items for the construction of a GPK scale without over-burdening teachers
- the potential for countries' and territories' results from the GPK cognitive assessment to be reported as a profile, using sub-scales to identify relative strengths and weaknesses in teachers' knowledge of instruction, learning and assessment.

The use of a common cognitive assessment questionnaire across the participating countries/territories ensures that data from the survey can be used to validly measure teachers' GPK as well as their background and teacher training, opportunities to learn about pedagogy, affective-motivational characteristics and teaching and professional practices. The data then allow studying how GPK varies across and within countries/territories.

### *Timeline*

The key stages and milestones for the development of the TKS instruments were as follows:

- May 2021 – establishment of the Teacher Knowledge Expert Group (TKEG).
- June 2021 – 1st and 2nd TKEG meetings: introduction and presentation of the systematic review of the ITEL TKS item bank.
- September 2021 – 3rd TKEG meeting: update on item review/development and the draft GPK blueprint.
- October 2021 – 4th TKEG meeting: review of new GPK items and feedback on draft assessment blueprint.
- April 2022 – 5th TKEG meeting: presentation of pilot analyses.
- June 2022 – 6th TKEG meeting: discussion of the TKEG's review of the proposed field trial instrument.
- February 2023 – TKEG update call to present key aspects of the field trial data analysis plan.
- July 2023 – 7th TKEG meeting: discussion of the field trial analysis report and GPK items for possible inclusion in the main survey.

- October 2023 – 8th TKEG meeting: presentation of updates on the survey design and changes to questionnaire and assessment items for the main survey.
- October 2024 – 9th TKEG meeting: presentation and discussion of the initial analysis of main survey data, psychometric quality, measurement invariance and dimensionality for GPK and further materials; additionally attended by select members of the TAG.

All TKEG meetings were held in virtual format. Written advice from the TKEG was sought at various points throughout the development process. In synchronicity with the development work for the TALIS core survey and TALIS Starting Strong, the consortium reported progress and insights at all scheduled TGB and NPM meetings. Dedicated special sessions for the countries and territories participating in the TKS were held at key milestones.

### **3.3.2. Item development phases**

#### *Review of existing questions, items and instruments*

As a first step of the item development phase, ACER reviewed 208 GPK items from the ITTEL study, attending to the quality of the item, estimated difficulty, item format and framework categorisation. This review led to the elimination of 54 items. The remaining 154 items were then reviewed by the TKEG. Each member of the TKEG independently rated them, using the following rating categories:

- Good: strong item/GPK relevance at ISCED level 2/cross-culturally appropriate/clearly worded/agree with the key.
- OK: fixable item/acceptable GPK relevance at ISCED level 2/may have some cross-cultural issues/wording lacks clarity but is fixable/disagree with key but fixable.
- Not OK: not a fixable item/not sufficiently GPK-relevant at ISCED level 2/likely to have cross-cultural problems/wording issues may not be fixable/key issues not fixable.

TKEG members were invited to add an explanation for how they rated each item, or to provide direction or advice on how the item might be improved or modified.

This process identified 82 items that TKEG members agreed were fit to retain, either with or without further modification. Modifications to existing items were made following the advice and recommendations of the TKEG, and each item was then mapped to the assessment framework and blueprint to identify the extent of coverage of the construct and any under-populated categories where new item development would be required.

New item development was undertaken by the ACER team in mid-2021 and mostly focused on items covering the assessment dimension of the GPK assessment framework, as well as thematic priorities identified via country consultation in May 2021. In all, 34 new items were developed, which were then reviewed by the TKEG in October 2021. Using the same rating scale as for the ITTEL items, each TKEG member independently rated each of the new items, 28 being retained for inclusion or further revision following TKEG advice.

This process of TKEG review and recommendation of GPK items continued through to the post-pilot and post-field trial analysis. The TKEG also provided guidance on the selection of questionnaire material. As this mainly derived from the TALIS core survey, it was not subject to modification for the TKS module. Only one background question regarding the subjects that teachers studied as part of their teaching qualification and/or were currently teaching, and one set of four contextual questions on teachers' opportunities to learn about topics related to pedagogy, were unique to the TKS, and these were therefore slightly modified after the field trial following TKEG advice.

### *Pilot study*

The original plan for was for pilot testing to be conducted in all participating countries and territories. At the time, however, only seven of the eight participating countries/territories were able to contribute. Small-scale pilot testing with convenience samples of (on average) 14 teachers per country/territory was conducted in February 2022 in 6 countries (Croatia, Morocco, Portugal, Saudi Arabia, South Africa and the United States). In addition, six countries (Chile, Croatia, Morocco, Portugal, South Africa and the United States) each piloted the items with one or two national experts. This resulted in 12 sources of feedback (6 teacher sources; 6 national expert sources) reflecting the views of 84 teachers and 11 national experts.

Two non-overlapping, paper-and-pen test forms were created with a total of 110 modified and newly developed GPK cognitive assessment items. Non-overlapping background and context questionnaire material was also included in each booklet. Because the majority of the TKS questionnaire material was being piloted for the TALIS core survey, the focus of the TKS piloting was to collect teacher and national expert perceptions and feedback on each of the GPK items, as well as to collect information on teachers' overall experience of taking an assessment of their GPK. This involved checking on various aspects such as:

- sufficient conceptual coverage of GPK from the perspectives of teachers/experts
- the conceptual understanding and clarity of the items
- international and cultural applicability of the knowledge being tested
- appropriateness of expected knowledge areas for teachers in each country/territory
- feasibility of the item formats.

Teachers individually completed a set of questionnaire material and GPK items using pen and paper under quasi-test conditions and then participated in a discussion about the GPK items in a cognitive laboratory format led by a designated facilitator. These sessions resulted in ratings per each GPK item, with feedback:

1. accept with no modifications
2. accept with modifications as described
3. prefer to omit item from assessment for reasons given.

National experts also conducted a separate review of the GPK items, offering feedback on the items using the same rating scale. All feedback data were returned to ACER for review. In addition, teacher responses to items were recorded, with the response data also returned and the items scored. There were not sufficiently high numbers of teachers to support a robust scaling analysis, but response frequencies for multiple-choice options, proportions of correct responses and item-rest correlations for all items were checked as part of the review. Rasch item response theory (IRT) analyses of the pooled multiple-choice data for each of the two test forms were also conducted.

Information collected from the pilot was used to inform further revision of the items and scoring in preparation for further review by TKEG members. Feedback from their review was used to complete a final revision of and reduction to the pool of GPK items, with 78 items advancing to field trial.

### *Field trial*

The field trial was conducted in early 2023; its objective was to test the survey instruments and operational procedures in all participating countries/territories. Sample sizes ranged from 133 to 513 teachers (from 24 to 40 schools) across participating countries and territories. The field trial instrument included 78 GPK items, more specifically 48 in SMC format and 30 in CMC format. This selection provided good overall coverage of the TKS assessment framework, meeting the blueprint targets set for the main survey

instrument of approximately one-third per GPK dimension. Other targets for the cross-cutting characteristics of items (i.e. cognitive demand, knowledge base and thematic orientation) were also met.

The items in the field trial item pool were allocated to 6 clusters of 13 items, each cluster representing a unique set of items. Clusters were established to be roughly equivalent with respect to GPK dimension, item format (SMC and CMC) and spread of expected item difficulty. Clusters were checked to ensure items covering the same or similar content were not placed within the same cluster and, where possible, test forms were established to minimise content overlap. Each teacher completed three of the six blocks, using a rotated block design. Each cluster appeared once in each of the first, second and third positions across the test forms, though not an equal number of times with other clusters. Two booklets of questionnaire material were also included, mostly derived from the TALIS core survey, and preceded the GPK assessment instrument. Each teacher completed one or other of the booklets of questionnaire material.

### *Analysis of results from the field trial and selection of items for the main survey*

The ACER team evaluated the measurement properties of the field trial GPK items, as well as the unique set of opportunities-to-learn (OTL) questions asked in the questionnaire section of the instrument. All other analysis of TALIS-derived questionnaire items was conducted by the IEA in conjunction with QEG core survey deliberations (see above).

For GPK items, ACER psychometricians undertook item and scale analysis and validation using Rasch modelling and classical test theory approaches. ACER also investigated the dimensionality of the GPK scale using exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and three-dimensional item response theory (IRT) modelling. Correlations between GPK weighted likelihood estimates (WLEs) and questionnaire scales were also explored.

Overall, the GPK items performed well in the field trial. Questions were generally well-matched to the GPK of the testing population, with an acceptable range of difficulty and an average facility close to the target of 50%. The questions generally also discriminated well and showed good fit statistics. Six items were discarded due to overall poor fit or discrimination, with a further ten questions flagged for review. The CFA, EFA and three-dimensional IRT modelling found that the GPK dimensions of instruction, learning and assessment were highly correlated and the GPK scale was found to be unidimensional. Some level of country differential item functioning (DIF) was found to exist for at least one participant country/territory in most of the questions, which for an assessment of this kind was to be expected. However, for most questions, the aggregate magnitude of country DIF was not extreme.

The ACER team identified a pool of 59 items deemed to be fit to advance to the main survey. These items included those that had, on balance, performed best psychometrically, showed the least amount of differential item functioning across countries/territories, provided an acceptable spread of difficulty, offered maximum score points and adequately covered the GPK assessment framework and blueprint. The remaining 19 items – identified as either less suitable or not suitable for advancement to the main survey – were also noted. Suggested minor modifications to some items were also included, where the evidence suggested such changes would improve their measurement properties.

TKEG members and the OECD Secretariat were asked to individually rate each of the 72 viable items using the following ratings:

- Include: strong support for including the item
- Consider: the item has merit and should at least be considered for inclusion
- Reconsider: the item does not have much merit and should perhaps not be considered for inclusion
- Exclude: strongly believe the item should not be included.

Each member was also invited to add comments or suggestions for each item to further explain their ratings. Feedback and recommendations from the TKEG and OECD demonstrated a high level of

agreement, with 43 items receiving universal agreement with minimal to no modifications necessary. After discussions with the TKEG, an additional 9 items for which there was two-thirds agreement were also added to the main survey item pool, leading to a final selection of 52 items (34 SMC and 18 CMC). These items presented a good fit to the main survey blueprint specifications, an acceptable range of difficulty and allowed for maximum score points for the generation of a GPK scale within a planned 25-minute test-taking timeframe.

For the selection of questionnaire material, the pool of questions used in the field trial needed to be reduced by 50% in order to keep the questionnaire section to about 30 minutes. Consideration was given to the correlational analysis conducted with GPK scales. However, as these correlations were generally quite weak, selection was mainly based on the material for which an existing body of research has already explored relationships with GPK, and those that would be most relevant or useful to understand in relation to GPK. For this process, each member of the TKEG and representatives from the OECD made independent recommendations.

Following a similar method used for the development of the field trial instrument, the GPK items in the main survey item pool were allocated to 4 clusters of 13 items, each cluster representing a unique set of items. Clusters were established to be roughly equivalent with respect to GPK dimension, item format (SMC and CMC) and spread of difficulty. Attention was also paid to ensuring clusters were equivalent in length, based on median response time data analysed from the field trial. Each teacher participating in the main survey was presented with 3 of the 4 GPK clusters (39 items), using a rotated block design. Each cluster appeared once in each of the first, second and third positions across the test forms, though not an equal number of times with other clusters. For the main survey, teachers received a single booklet of questionnaire material, which they answered before moving on to the GPK assessment.

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# 4 Preparation of national survey instruments

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This chapter outlines the procedures for preparing national survey instruments for the OECD Teaching and Learning International Survey (TALIS) 2024, including adaptation, translation and layout verification. All participating countries and territories adapted the English source instruments to their local contexts, following strict international standards to ensure comparability. The process involved decentralised translation, independent verification by cApStAn and detailed documentation via the International Association for the Evaluation of Educational Achievement StudyExpert system. Special attention was given to maintaining consistency with TALIS 2018 for trend analysis. The chapter also highlights national feedback, confirming the effectiveness of the quality control measures.

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## 4.1. Introduction

This chapter summarises the procedures and outcomes for national adaptation and translation verification, and includes information about the layout verification process of the OECD Teaching and Learning International Survey (TALIS) instruments. The international adaptation, translation and layout verification of all specified instruments in the identified target languages was conducted before the field trial and main data collection of TALIS 2024. As all instruments underwent the same processes, this chapter does not contain separate sections for TALIS core survey, the Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) and the Teacher Knowledge Survey (TKS).

Quality control during production of the national instruments helped ensure the collection of high-quality data that can be compared internationally across countries/territories and over time. The materials for each country/territory and survey language were carefully cross-checked against the international source version, that is, the international (English-language) instruments (OECD, 2024<sup>[1]</sup>; OECD, 2024<sup>[2]</sup>; OECD, 2024<sup>[3]</sup>; OECD, 2024<sup>[4]</sup>; OECD, 2024<sup>[5]</sup>; OECD, 2024<sup>[6]</sup>; OECD, 2024<sup>[7]</sup>), the versions for the different target populations and the versions used in the previous TALIS cycle (TALIS 2018).

The development of the various target questionnaires produced from the international source version (in English), ranging from one to five different target populations (if and when applicable), was successful with respect to ensuring accuracy and consistency, not only within the national materials for each country/territory but also across the national survey instruments used by each participating country/territory and against the TALIS 2018 national versions (if applicable).

## 4.2. Overview of adaptation and translation verification

The TALIS 2024 survey instruments were reviewed during several stages of their preparation. Instruments included questionnaires (online and paper data collection) and cover letters for online data collection that contained information about TALIS and a link to the online questionnaires. The reviews focused on approving national modifications to all instruments (in a given target language) and this chapter describes the procedures related to that work, which encompassed three major activities:

- adaptation and translation of the international (English-language) source versions of the TALIS instruments and accompanying materials into the national languages
- international verification of the national translations and adaptations
- international layout verification of the final national instruments.

All participating countries/territories had to meet the procedural requirements for translation and translation verification (including the submission and review procedures) outlined in the TALIS 2024 Technical Standards (specifically Standards 4.1-4.37) (OECD, 2025<sup>[8]</sup>). The TALIS 2024 Survey Operations Procedures (SOP), Unit 3, provided to all TALIS 2024 national project managers (NPMs), contained detailed instructions on instrument preparation.

The survey instruments, developed as an international version in English, were released to the national centres during three key phases. The first phase consisted of a pilot study, during which experts reviewed the survey instruments. Each national centre was asked to translate the pilot instruments into their local language(s) or, if pilot participants could understand English, national centres could use the international source version of the instruments adapted to the local context. Because the piloted national TALIS questionnaires were used solely to collect qualitative data and feedback rather than quantitative, internationally comparable data, national adaptations and translations were not examined by external verifiers.



The second and third key phases were the field trial and the main survey respectively. During these phases, the national questionnaires underwent stringent independent adaptation, translation and layout verification processes. The national centres began this work by adapting the international source version of the questionnaires to fit their respective national or subnational contexts. This work included structural and non-structural adaptations of questions (see Section 4.4) and, to a very limited extent, national additions of items, categories and questions. Each national centre documented their adaptations to their national survey instruments using the International Association for the Evaluation of Educational Achievement (IEA) StudyExpert software. The TALIS 2024 international study centre (ISC) was responsible for verifying all documented adaptations.

In preparation for the field trial and the main survey, decentralised translation took place. This meant that each country/territory was responsible for adapting and translating its own national instruments from the international source version. The translation process required translation and translation review at the national level.

During the translation verification process, overseen by IEA Amsterdam, independent language specialists at cApStAn Linguistic Quality Control (a member of the consortium specialising in validating translations of international survey instruments) compared the translated instruments side by side with the international version. Upon completion of the verification, IEA Amsterdam returned the instruments – each of which contained verifier feedback accompanied by a severity code (established by the IEA, see Section 4.9) – to the TALIS 2024 NPMs and asked them to review the verifiers' comments and improve the translations or adaptations in line with IEA guidelines. From there, the NPMs submitted the instruments to the ISC for verification of the layout, after which the NPMs finalised their respective sets of instruments for data collection.

### 4.3. Instruments requiring adaptation and translation

- one principal questionnaire template, requiring a variety of mandatory adjustments for the different International Standard Classification of Education (ISCED) levels
- one teacher questionnaire template, requiring a variety of mandatory adjustments for the different ISCED levels (Forms A, B and C)
- one principal cover letter template for online administration, requiring a variety of mandatory adjustments for the different ISCED levels
- one teacher cover letter template for online administration, requiring a variety of adjustments for the different ISCED levels
- one TALIS Starting Strong leader questionnaire template requiring a variety of mandatory adjustments for the different ISCED levels
- one TALIS Starting Strong leader cover letter template for online administration, requiring a variety of adjustments for the different ISCED levels
- one TALIS Starting Strong staff questionnaire template requiring a variety of mandatory adjustments for the different ISCED levels
- one TALIS Starting Strong staff cover letter template for online administration, requiring a variety of adjustments for the different ISCED levels
- one TKS teacher questionnaire template
- extra quality control questions
- login pages for online administration
- system messages for online administration.

The TALIS 2024 School/Early Childhood Education and Care (ECEC) Setting Co-ordinator Manual and National Quality Observer Manual also needed to be adapted and translated into the language(s) used by the school co-ordinators and national quality observers (NQOs). Although the manuals were not subject to international translation or layout verification procedures, national translations of and adaptations to the manuals had to adhere to TALIS procedures. The IEA's independent international quality observers (IQOs) reviewed the national version(s) of the School/ECEC Setting Co-ordinator Manual and included their comments in their annual reviews (for details, see Chapter 7).

#### 4.4. Identifying the target language(s)

Most countries and territories taking part in TALIS 2024 administered the survey in one predominant language, typically the language used throughout their entire education system or at least understood by all respondents. Of the 55 participating countries/territories, 15 administered the survey in more than 1 language (with the number ranging from 2 to 5 languages). The ISC advised these countries/territories to involve professionals familiar with more than one of these languages to review the translations and to ensure equivalency across versions.

Participating countries/territories translated the principal/leader and teacher/staff questionnaires into the languages listed in Table 4.1. The countries/territories that conducted online data collection translated cover letters to be distributed to participants. The cover letters contained information about the study, the web address for accessing the online questionnaire and a space in which the national centre would place a label containing the individualised user login information for the participant.

In general, each set of instruments underwent two rounds of translation verification, one for the field trial and one for the main survey. However, six of the languages administered during the main survey were not administered during the field trial. In Norway, only Bokmål was verified and administered during the field trial. For the main survey, both Bokmål and Nynorsk were verified and administered. Due to the similarities between Bokmål and Nynorsk, the national centre and the ISC agreed that the Nynorsk version, adapted from the Bokmål version, would only be administered and verified during the main survey. In Finland, the only language used during the field trial was Finnish. For the main survey, Finland also administered Swedish. Finland used the Swedish translation from Sweden as the starting point for translating the instruments into Swedish for Finland. Due to the small number of schools in Finland that use Swedish, it was agreed between the national centre and ISC that a Swedish version would not be used during the field trial to prevent under-representation of these schools during the main survey. For Spain, only Spanish (Castilian) was verified and administered for the field trial. For the main survey, Basque, Catalan, Galician, Spanish (Castilian) and Valencian were verified and administered. Due to co-ordination challenges experienced by the national centre and limited resources, the ISC agreed that Spain would only administer Spanish (Castilian) during the field trial.

As documented in the table below, several countries/territories used English versions of the instruments. These countries/territories all made national adaptations to the international source version and submitted them for adaptation verification, language verification and layout verification.

**Table 4.1. Languages used in TALIS 2024**

| Participating country/territory | Main survey language(s) |
|---------------------------------|-------------------------|
| Albania                         | Albanian                |
| Alberta (Canada)                | English                 |
| Australia                       | English                 |
| Austria                         | German                  |
| Azerbaijan                      | Azerbaijani and Russian |
| Bahrain                         | Arabic, English         |

| Participating country/territory | Main survey language(s)                                      |
|---------------------------------|--------------------------------------------------------------|
| Brazil                          | Portuguese                                                   |
| Bulgaria                        | Bulgarian                                                    |
| Chile                           | Spanish                                                      |
| Colombia                        | Spanish                                                      |
| Costa Rica                      | Spanish                                                      |
| Croatia                         | Croatian                                                     |
| Cyprus                          | Greek and English                                            |
| Czechia                         | Czech                                                        |
| Denmark                         | Danish                                                       |
| Estonia                         | Estonian                                                     |
| Finland <sup>1</sup>            | Finnish and Swedish                                          |
| Flemish Community (Belgium)     | Flemish (Dutch)                                              |
| France                          | French                                                       |
| French Community (Belgium)      | French                                                       |
| Germany                         | German                                                       |
| Hungary                         | Hungarian                                                    |
| Iceland                         | Icelandic                                                    |
| Ireland                         | English and Irish                                            |
| Israel                          | Hebrew and Arabic                                            |
| Italy                           | Italian                                                      |
| Japan                           | Japanese                                                     |
| Kazakhstan                      | Kazakh and Russian                                           |
| Korea                           | Korean                                                       |
| Kosovo                          | Albanian                                                     |
| Latvia                          | Latvian                                                      |
| Lithuania                       | Lithuanian                                                   |
| Malta                           | English                                                      |
| Montenegro                      | Montenegrin                                                  |
| Morocco                         | Arabic                                                       |
| Netherlands                     | Dutch                                                        |
| New Brunswick, Quebec (Canada)  | English and French                                           |
| New Zealand                     | English and Māori                                            |
| North Macedonia                 | Macedonian and Albanian                                      |
| Norway <sup>2</sup>             | Bokmål and Nynorsk                                           |
| Poland                          | Polish                                                       |
| Portugal                        | Portuguese                                                   |
| Romania                         | Romanian                                                     |
| Saudi Arabia                    | Arabic and English                                           |
| Serbia                          | Serbian                                                      |
| Shanghai (China)                | Mandarin                                                     |
| Singapore                       | English                                                      |
| Slovak Republic                 | Slovak                                                       |
| Slovenia                        | Slovene                                                      |
| South Africa                    | English                                                      |
| Spain <sup>3</sup>              | Basque, Catalan, Galician, Spanish (Castilian) and Valencian |
| Sweden                          | Swedish                                                      |
| Türkiye                         | Turkish                                                      |
| United Arab Emirates            | Arabic and English                                           |
| United States of America        | English                                                      |
| Uzbekistan                      | Uzbek and Russian                                            |

| Participating country/territory | Main survey language(s) |
|---------------------------------|-------------------------|
| Viet Nam                        | Vietnamese              |

1. For Finland, only Finnish was administered during the field trial.
2. For Norway, only Bokmål was administered during the field trial.
3. For Spain, only Spanish (Castilian) was administered during the field trial.

## 4.5. Adaptations

Adaptations were kept to a minimum, but some were mandatory to ensure that the principals/leaders and teachers/staff in each country/territory received questions equivalent to those administered to principals/leaders and teachers/staff in all other countries/territories. Revisions included structural and non-structural changes, as well as mandatory and elective adaptations.

**Structural adaptations:** The term “structural adaptation” referred to any adaptation that altered the structure of the international source version by: removing, adding or splitting categories; removing, adding or splitting national dimensions; removing or adding questions; or changing the width and range definition for a question.

**Non-structural adaptations:** Non-structural adaptations referred to adaptations that did not change the structure of the questionnaires compared with the structure of the international source version, that is, neither added nor subtracted questions, dimensions or categories to or from the instruments. Adaptations typically involved adapting terms and phrases to fit the cultural context of each country/territory. Adaptations of terms or phrases were more than pure translation since international terms or phrases were replaced by national terms or phrases.

**Mandatory adaptations:** The international questionnaires contained terms or phrases that needed to be adapted at the national level. These adaptations were non-structural because they did not alter the structure of the instrument but adapted it to fit a local context. To facilitate the mandatory adaptation process, international versions of the questionnaires included brackets and yellow highlighting to indicate the places where mandatory adaptations were needed.

- Square brackets [...]: These required NPMs to add nationally specific information such as that relating to procedures on how to return questionnaires and specification of deadlines, for example, “[national return procedures and date]”.
- Angle brackets <...>: These required NPMs to replace the words in the brackets with country-/territory-appropriate term or terms. Some of these words related to the target populations (respondents). For example, <ISCED Level x> needed to be replaced with the appropriate educational level set out in the ISCED 2011 mapping (UNESCO-UIS, 2012<sup>[9]</sup>) such as “lower secondary education”. Additional advice and instruction in the TALIS 2024 Survey Operations Procedures, Unit 3, also helped NPMs identify appropriate adaptations.

**Elective adaptations:** Countries/territories could apply additional non-structural adaptations, such as replacing (where necessary) terms or phrases with terms or phrases relevant to their respective contexts and cultures. Examples included names of specific institutions and ways of addressing people. Elective adaptations also included the following:

- Valid ranges (if necessary), removal of non-applicable questions or dimensions, and addition of categories (if necessary).
- National questions. National centres were permitted to add these questions at the very end of the questionnaire. These national questions could be ones developed by the participating countries/territories themselves or be items originally discarded from the international instrument but still deemed appropriate for implementation. The ISC stipulated, as a rule, that

these additional questions should add no more than five minutes of response time to a questionnaire's total response time.

During the adaptation process, participating countries/territories decided not to administer certain items. A table of affected questions, dimensions and categories excluded from the national questionnaires can be found in Annex B of the *Teaching and Learning International Survey (TALIS) 2024 User Guide* (OECD, forthcoming<sup>[10]</sup>).

## 4.6. Documentation of national instrument preparation

All changes, selections and adaptations to the TALIS instruments were implemented with the goal of creating an international database containing comparable data from all participating countries/territories. NPMs noted all revisions to the instruments for the main survey within the IEA StudyExpert software. NPMs received training in using IEA StudyExpert and were required to work on their adaptations within IEA StudyExpert for each language in which they intended to administer the instruments. IEA StudyExpert ultimately contained the complete translation, adaptation and verification history of each set of national instruments for every applicable target population and was, therefore, an integral part of the adaptation and translation processes, international translation verification as well as layout review and layout verification.

During preparation of the national instruments, the main steps of documentation were as follows:

- **Step I, approval of adaptations:** The ISC reviewed the proposed adaptations entered in IEA StudyExpert. Terms and items used in TALIS 2018 had to be adapted identically to allow for trend analyses. The ISC released the TALIS 2018 main survey instruments as a reference. The ISC also provided all participating TALIS 2024 countries/territories with the link to the ISCED 2011 mapping (UNESCO-UIS, 2012<sup>[9]</sup>) to use this resource for referencing the ISCED levels.
- **Step II, translation verification:** External language experts (from cApStAn) reviewed the translated (updated) instruments within IEA StudyExpert, referring to the documentation within the software when relevant and commenting on any implemented adaptations. The experts also verified translations of the cover letters, system messages and login pages for online administration, extra quality control questions as well as the other international components (ISCED levels 1 and 3, TALIS Starting Strong, TKS).
- **Step III, layout verification:** During this stage, the ISC compared the layout of the national instruments with the international source version within IEA StudyExpert and noted any deviations from the international versions in IEA StudyExpert.
- **Step IV, national instrument sign-off:** Following layout verification, NPMs were asked to take a final look at their national instruments, review and confirm via email that their national questionnaires were ready for administration.
- **Step V, codebook verification:** The ISC created a national codebook for each country/territory asked to check the structure of the national codebook.

## 4.7. Hierarchy of international components during instrument preparation

TALIS 2024 offered countries/territories the opportunity to survey not only the international target population, that is, teachers and principals in schools providing lower secondary education (ISCED level 2) but also the populations of teachers and principals at ISCED levels 1 and 3 and those individuals involved in TALIS Starting Strong and the TKS. Countries/territories that chose to survey teachers/staff and principals/leaders from more than one of the target populations needed to ensure that the different survey

instruments were consistent across target populations. Deviations across target populations were only permissible if the country/territory could justify them and if the ISC approved those justifications.

As a further means of quality control, the ISC asked countries/territories to produce the ISCED level 2 version of the instruments in the predominant survey language and to use this version as the main blueprint for ISCED levels 1 and 3 instruments and/or additional language(s). This key process was ingrained in the survey operations to ensure that all national materials were of high quality and consistent across the different instruments used within one country/territory.

The ISCED levels 1 and 3 instruments were not subject to a full translation verification. Instead, revisions were recorded in IEA StudyExpert, and verifiers then checked these changes. A thorough consistency check during layout verification ensured that only ISC-approved adaptations to ISCED levels 1 and 3 instruments were implemented and that the rest of the instruments matched the ISCED level 2 instruments.

Preparation of the TALIS Starting Strong and TKS instruments followed the same procedure used for preparing the ISCED level 2 questionnaires.

Fifty-four participating countries/territories implemented the survey at ISCED level 2, 15 at ISCED level 1, 8 at ISCED level 3, 15 at ISCED level 02, 8 for children under the age of three (U3) and 8 for the TKS (Table 4.2).

**Table 4.2. List of target populations administered in TALIS 2024 by country/territory**

| Participating country/territory | U3 | ISCED 02 | ISCED 1 | ISCED 2 | ISCED 3 | TKS |
|---------------------------------|----|----------|---------|---------|---------|-----|
| Albania                         |    |          |         | ✓       |         |     |
| Alberta (Canada)                |    |          |         | ✓       |         |     |
| Australia                       |    |          | ✓       | ✓       |         |     |
| Austria                         |    |          |         | ✓       |         |     |
| Azerbaijan                      |    |          |         | ✓       |         |     |
| Bahrain                         |    |          |         | ✓       |         |     |
| Brazil                          |    |          | ✓       | ✓       |         |     |
| Bulgaria                        |    |          |         | ✓       |         |     |
| Chile                           |    | ✓        |         | ✓       |         | ✓   |
| Colombia                        |    | ✓        |         | ✓       |         |     |
| Costa Rica                      |    |          |         | ✓       |         |     |
| Croatia                         |    |          |         | ✓       | ✓       | ✓   |
| Cyprus                          |    |          |         | ✓       |         |     |
| Czechia                         |    |          |         | ✓       |         |     |
| Denmark                         |    | ✓        |         | ✓       | ✓       |     |
| Estonia                         |    |          |         | ✓       |         |     |
| Finland <sup>1</sup>            |    | ✓        |         | ✓       |         |     |
| Flemish Community (Belgium)     | ✓  | ✓        | ✓       | ✓       | ✓       |     |
| France                          |    |          | ✓       | ✓       |         |     |
| French Community (Belgium)      |    |          | ✓       | ✓       |         |     |
| Germany                         | ✓  | ✓        |         |         |         |     |
| Hungary                         |    |          |         | ✓       |         |     |
| Iceland                         |    |          |         | ✓       |         |     |
| Ireland                         | ✓  | ✓        |         |         |         |     |
| Israel                          | ✓  | ✓        |         | ✓       |         |     |
| Italy                           |    |          |         | ✓       |         |     |

| Participating country/territory | U3 | ISCED 02 | ISCED 1 | ISCED 2 | ISCED 3 | TKS |
|---------------------------------|----|----------|---------|---------|---------|-----|
| Japan                           |    | ✓        | ✓       | ✓       |         |     |
| Kazakhstan                      |    |          |         | ✓       |         |     |
| Korea                           |    |          | ✓       | ✓       |         |     |
| Kosovo                          |    |          |         | ✓       |         |     |
| Latvia                          |    |          |         | ✓       |         |     |
| Lithuania                       |    |          |         | ✓       |         |     |
| Malta                           |    |          |         | ✓       |         |     |
| Montenegro                      |    |          |         | ✓       |         |     |
| Morocco                         |    | ✓        | ✓       | ✓       |         | ✓   |
| Netherlands                     |    |          | ✓       | ✓       |         |     |
| New Brunswick (Canada)          | ✓  |          |         |         |         |     |
| New Zealand                     | ✓  | ✓        | ✓       | ✓       |         |     |
| North Macedonia                 |    |          |         | ✓       |         |     |
| Norway <sup>2</sup>             | ✓  | ✓        |         | ✓       |         |     |
| Poland                          |    |          |         | ✓       |         | ✓   |
| Portugal                        |    |          |         | ✓       | ✓       | ✓   |
| Quebec (Canada)                 | ✓  |          |         |         |         |     |
| Romania                         |    |          |         | ✓       |         |     |
| Saudi Arabia                    |    |          | ✓       | ✓       | ✓       | ✓   |
| Serbia                          |    |          |         | ✓       |         |     |
| Shanghai (China)                |    |          |         | ✓       |         |     |
| Singapore                       |    |          |         | ✓       |         |     |
| Slovak Republic                 |    |          |         | ✓       |         |     |
| Slovenia                        |    |          | ✓       | ✓       | ✓       |     |
| South Africa                    |    |          |         | ✓       |         | ✓   |
| Spain <sup>3</sup>              |    | ✓        | ✓       | ✓       |         |     |
| Sweden                          |    | ✓        |         | ✓       |         |     |
| Türkiye                         |    | ✓        | ✓       | ✓       | ✓       |     |
| United Arab Emirates            |    |          | ✓       | ✓       | ✓       |     |
| United States of America        |    |          |         | ✓       |         | ✓   |
| Uzbekistan                      |    |          |         | ✓       |         |     |
| Viet Nam                        |    |          |         | ✓       |         |     |

1. See Note 1 under Table 4.1

2. See Note 2 under Table 4.1

3. See Note 3 under Table 4.1

## 4.8. Engaging translators

The ISC advised NPMs to engage a minimum of two translators for each language in which their respective countries/territories intended administering the survey. Translators needed to have the target language as their mother tongue, possess excellent knowledge of English and be familiar with survey instruments. In addition, a good level of computer literacy, a computer with a Windows desktop or Windows server operating system and a reliable Internet connection were necessary to translate instruments in the IEA StudyExpert system.

The first of these translators, who was expected to be not only a language specialist but also someone with a sound understanding of the country's/territory's cultural context, translated the international source



version and manuals into the national language. The second translator, known as the reviewer, was expected to possess experience in the national educational context and be familiar with the subject of the study, and reviewed the translated materials to check the accuracy, readability and consistency with the international source version and trend version (if applicable) of the instruments.

The ISC reminded NPMs planning to divide up the translation work or to produce translations in more than one language of the importance of ensuring consistency within and across instruments. The ISC also encouraged the countries/territories that intended producing the survey instruments in more than one language to engage professionals familiar with all of those languages as special reviewers so as to establish equivalence across translations.

## 4.9. Producing translations

For English-speaking countries/territories, the instrument preparation process involved adapting language, terminology and classifications to local requirements. Countries/territories administering the survey in a language or languages other than English had to adapt and translate all survey materials into the local language(s).

The TALIS 2024 Survey Operations Procedures, Unit 3, Instrument Preparation (main survey) specified the need for translations not only to follow the rules of the target language and the country's/territory's national/school context but also to have the same meaning as the source text. The ISC produced a glossary document containing definitions and explanations of the most critical terms to help translators prepare sets of instruments that captured the meaning and intent of the international source version while safeguarding against inaccuracies or word-for-word translations that were not appropriate within the national language and context.

Upon the release of the TALIS 2024 field trial instruments, countries/territories were to translate the questions/items. For countries that participated in TALIS 2018, some of the questions/items were considered as trend and the process regarding trend translations is covered in the following section.

The translator's role was to prepare a full translation of the questionnaires and accompanying materials. Translators introduced the mandatory adaptations for the international components and, where applicable, documented the adaptations in a form called Term Adaptations Documentation located in IEA StudyExpert. The translated texts needed to ensure understanding and natural flow to the extent that anyone reading the texts could not tell that they had originated in English. Guidance on language use during translation, as outlined in the TALIS 2024 Survey Operations Procedures, Unit 3, Instrument Preparation (main survey), comprised the following:

- The translated text should have the same register (language level and degree of formality) as the source text.
- The translated text should have correct grammar and usage (e.g. subject/verb agreement, prepositions, verb tenses, etc.).
- The translated text should not add text to or omit text from the source version unless the ISC agreed to this.
- The translated text should employ equivalent qualifiers and modifiers appropriate for the target language.
- The translated text should have the equivalent social, political or historical terminology appropriate for the target language and used at this level of education.
- Idiomatic expressions should be translated appropriately, not necessarily word for word.
- Spelling, punctuation and capitalisation in the target text should be appropriate for the target language and the country/territory or cultural context.

When the individuals in the national centres responsible for the translation work completed their work, reviewers read and reviewed the materials to ensure that the translations were appropriate for teacher/staff and principal/leader respondents, accurate, readable, consistent with the international source version and trend (if applicable) version of the instruments and met the requirements of TALIS 2024. After the reviewers had completed their review and commented on the consistency and quality of the translations, the translators were expected to integrate the changes into the instruments. The country's/territory's NPM subsequently reviewed the translations and the reviewer's comments, acted as an arbitrator on disagreements between the translator and reviewer, and had the right to make the final decision on translations. This method meant that three independent people compared the national versions against the original international source version in English.

#### 4.10. Trend translations

The TALIS 2024 instruments contained questions/items used in TALIS 2018 and these questions/items provided a basis for comparing data collected by the countries/territories that participated in both TALIS surveys. The TALIS 2024 countries/territories that had participated in TALIS 2018 were obligated to use the translations from the earlier cycle in order to ensure consistency and therefore possible comparability of data across the two surveys. The ISC asked the national centres to adhere to this objective when updating the field trial instruments for the TALIS 2024 main survey. When the field trial instruments were released to countries to begin instrument preparations, NPMs were required to review their national trend translations.

To help with their review, the ISC made sure that the NPMs had access to the approved TALIS 2018 main survey instruments for reference. If, when comparing the TALIS 2018 translations to the TALIS 2024 field trial translations, NPMs viewed a translation from TALIS 2018 as not appropriate or had any other concerns regarding the translation, the ISC asked the NPMs to address these issues and concerns by contacting the ISC. The ISC then reviewed the documentation to determine if the changes would influence the ability to preserve trend measurement. If a change was viewed as affecting trend, the NPM had to decide whether to revert the change and maintain the trend measure or keep the change and lose the trend measure.

Following the field trial all remaining trend items were locked in IEA StudyExpert to prevent editing and ensure identicalness to trend. During the TALIS 2024 main survey instrument preparation, NPMs were asked to review the trend items again. If any remaining issues were found, the NPMs were to document the issues, then make a request to the ISC to unlock the trend item. Similarly to the field trial process, the ISC then reviewed the documentation to determine if the change would influence the ability to preserve trend measurement. If the change was approved by the ISC, the item was then unlocked and the NPM was allowed to implement the change.

#### 4.11. International translation verification

International translation verification was an important part of the TALIS 2024 Technical Standards (specifically Standards 4.26-4.30). IEA Amsterdam co-ordinated the translation verification process in collaboration with cApStAn Linguistic Quality Control, based in Brussels, Belgium, which engaged the services of native-speaking linguistic verifiers. The verifiers' role was to compare the translation to the source sentence-by-sentence and item-by-item and ensure that:

- The translation reflects the source and is linguistically correct.
- The translation and adaptation notes are followed.
- The term definitions and explanations are reflected.

- The agreed required and non-required adaptations are implemented as documented, with reactions to each entry in IEA StudyExpert.
- The trend questions remain unchanged.
- The errata are corrected in the target.
- They react to comments from the country/territory and from IEA.

In terms of generic guidelines, the verifiers were asked to pay special attention to:

- **Clarity and fluency:** The target should not sound like a translation; any ambiguity or connotations should be avoided.
- **Completeness:** No information should be omitted, and no additional information should be added.
- **Temporal and spatial frameworks:** Concepts such as “always” or “at school” should be appropriately rendered.
- **Consistency:** Questions, questionnaires, context and scales should be consistent.
- **Adaptations:** The intentional deviations from the source should be appropriate and linguistically correct.
- **Semantic distance:** Semantic distances in scales should match the source.
- **Text formatting:** Typographic features such as underlined, bold or italic text should be reflected correspondingly.

The verification feedback was reviewed firstly by cApStAn, then by IEA Amsterdam, before being sent to the country/territory. The ISC then asked the NPMs to carefully review all verifier comments and suggestions and to implement those that improved the materials according to the IEA's guidelines for translation, while also ensuring that the translations retained the original meaning of the phrases. Although NPMs always had the right to make final decisions regarding national translations, they had to describe and explain any major differences of opinions between national centre personnel and verifiers. The ISC reviewed all differences of opinion and, in cases where the ISC wanted an additional opinion, it asked the translation referee to review and provide his/her opinion on the translation and documentation.

In cases of divergent expert opinions on translation matters, the ISC engaged a translation referee to provide arbitration. In 2021, cApStAn recommended Michèle Ernst Staehli for this role, a proposal that was subsequently agreed upon between the OECD and ISC.

Michèle Ernst Staehli is Head of the International Surveys Group at Swiss Centre of Expertise in the Social Sciences (FORS). She holds dual Doctor of Philosophy degrees in Sociology from the University of Marne-la-Vallée and in Social Sciences from the University of Lausanne. She is fluent in English, French, German and Italian and brings more than 15 years of academic experience in the sociology of work and social science methodology, complemented by practical expertise in managing scientific surveys at a Swiss fieldwork agency.

Since 2010, Michèle Ernst Staehli has led the international surveys team at FORS, acting as the Swiss National Co-ordinator for the European Social Survey (ESS). Her research focuses on key methodological issues in survey implementation, including questionnaire translation, response incentives, non-response bias and mixed-mode data collection strategies. In parallel, she continues collaborative work in her PhD research area with the Swiss National Centre of Competence in Research “LIVES – Overcoming Vulnerability: Life Course Perspectives” (NCCR LIVES).

During the field trial (FT), all administered national versions underwent full verifications of the translations, which means that every aspect of the translation was reviewed in comparison to the source. For countries/territories that participated in TALIS 2018 with trend questions/items, in the FT the verifier reviewed and compared the TALIS 2024 version of these questions/items with the TALIS 2018 version to ensure identical translations.

For the main survey (MS), all national versions underwent focused verifications, except those that were not administered in the FT, which underwent full verifications. In a focused verification, the verifiers reviewed the national versions with their main focus being on all changes implemented to the translations from the FT to MS. The FT to MS procedure involved applying updates shared by the item developers following the analysis of the FT international data. During this process, the verifiers accessed and reviewed the international source version and accompanying materials in IEA StudyExpert and made sure that the FT to MS changes shared by the item developers were implemented in the target versions. In addition to the international FT to MS changes, NPMs were to review, revise and document any changes they implemented to their FT to MS translations based on the analysis of their FT data. The national changes were also reviewed by the verifiers to ensure alignment with the international source version and accurate documentation. After the FT all trend questions/items for countries/territories that participated in TALIS 2018 were locked from editing. This led to the difference in procedure for verifying trend questions/items during the MS as only the trend/questions which were unlocked by the ISC to allow NPMs to implement an approved correction were reviewed by the verifiers.

During translation verification, verifiers inserted their comments and made changes directly in the national instruments (displayed side by side with the international source version). Verifiers also documented and recorded (in the form of comments) any deviations from the international source version and trend version, if applicable, and used the IEA severity code system to indicate the severity of the identified error or issue.

Each verifier comment contained one of the following severity codes:

- **Code 1: Major change or error.** Examples included the incorrect order of choices in a multiple-choice item, omission of an item, incorrect translation resulting in the answer being indicated by the item, an incorrect translation that changed the meaning or difficulty of the text/item and the incorrect order of items.
- **Code 1?: Discuss with ISC.** The verifiers used a Code 1? when they were unsure of how to correct a possible error and/or an input from the ISC was needed.
- **Code 2: Minor change or error.** Examples included spelling errors that did not affect comprehension.
- **Code 3: Suggestion for alternatives.** The translation might be adequate, but the verifier suggested different wording.

During the FT, if a national adaptation was implemented as documented, or a trend change was implemented as documented, the verifier entered a comment of “OK” and set the severity of the comment to “-”. For the MS this process differed slightly, as the verifiers were asked to enter the comment “Implemented as documented” instead of “OK”.

## 4.12. Feedback from NPMs on translation and international translation verification

The ISC developed a survey activities questionnaire (SAQ) that it administered after the field trial and again after collection of main survey data. The questionnaire, designed to elicit feedback from NPMs on their experiences administering TALIS 2024, included questions on the translation and international translation verification processes. Responses to the SAQ administered after the main data collection period indicated that the NPMs found the international translation verification process benefitted from preparation of the main survey.

All NPMs of the 57 participating countries/territories answered the SAQ. Their answers showed that most of the participants (54 of the 57) found the guidelines for translation and translation verification described in SOP Unit 3, clear and sufficient, experienced no difficulties translating the international source version

of the questionnaires into national language(s) or adapting them to local contexts (35 of the 57), or any problems with translation or international translation verification beyond that (46 out of 57). Most of the NPMs identified the international translation verification feedback provided by the verifier/s as useful (54 out of 57) and reported that after reviewing the feedback from the verifiers, they made several modifications to their instruments; 45 of the 57 said they corrected errors identified by the verifiers.

#### 4.13. Layout verification: Online and paper administration

As a final step during production of the national instruments and after completion of the translation verification process, the ISC verified the layout of the online versions of the instruments and created the paper versions of the questionnaires in Word format for countries/territories using paper questionnaires. The production of paper questionnaires was conducted after layout verification for the online questionnaires was complete and layout of the online questionnaires was approved by the NPM.

The ISC carefully checked the national versions of the instruments against the international source version and the documented discrepancies within IEA StudyExpert. The aim of the layout verification was to ensure that the national versions of the TALIS instruments looked, as much as possible, like the international source version and that the online and paper versions were, to the greatest extent possible, equivalent.

NPMs informed the ISC that their online instruments were ready for layout verification. ISC staff then checked each questionnaire for missing items/response options/instructions, filter options, numbering, font size, font changes, blank pages, word emphases, page breaks, missing bold font/underlining, etc. If ISC staff found issues in the layout, the NPM was asked to implement the ISC's feedback in the online instruments.

After online layout approval, the ISC prepared the paper questionnaires for the countries and checked each paper version of an instrument against the approved online version. This practice helped to ensure that the instruments within one country/territory were the same. Visual checks were run using the same standards and procedures as for verification of the online layout. After finalising the paper questionnaires, the ISC asked each NPM to thoroughly check the files and report any mismatching to the ISC. Once the mismatches were resolved, the NPM was asked to confirm that the paper versions of the instruments were final and ready for release.

The majority of NPMs (53 of the 57) found the instructions for layout checks provided by the ISC helpful for preparing their national survey instruments.

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# 5

## Sampling design

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The international target population for the OECD Teaching and Learning International Survey (TALIS) 2024 consisted of teachers providing International Standard Classification of Education (ISCED) level 2 education and the principals of the schools where they work. This is also referred to as the TALIS core survey target population. Teachers in ISCED level 2 were also the target population for the Teacher Knowledge Survey (TKS) in countries/territories that chose to administer it. Participating countries/territories could also opt to survey primary (ISCED level 1) and upper secondary (ISCED level 3) teachers. The international target population for TALIS Starting Strong consisted of staff providing learning opportunities or care for children in pre-primary (ISCED level 02) settings or in settings for children under the age of three years (U3). This chapter covers the sample design prepared for the TALIS 2024 countries/territories.

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## 5.1. Overview

This chapter covers the sample design prepared for and implemented in the countries/territories participating in the OECD Teaching and Learning International Survey (TALIS) 2024. It details the sampling strategies used and describes all steps of the sample selection process.

Chapter 9 and Annex D of this report complement this current chapter. Chapter 9 details the strategies used to estimate the characteristics of the populations of interest and their sampling errors, while accounting for the design features described here. Annex D provides the characteristics of each national sampling plan.

## 5.2. ISCED levels 1, 2 and 3

### 5.2.1. International sampling plan

The populations of interest comprised schools providing International Standard Classification of Education (ISCED) level 2 (lower secondary) education, as well as their principals and teachers. Participating countries/territories could opt to additionally survey ISCED level 1 (primary education) and ISCED level 3 (upper secondary education) teachers.

The international sampling plan prepared for each of the TALIS 2024 teacher populations was, in essence, a systematic stratified two-stage cluster probability sampling design. This design meant that schools (first-stage or primary sampling units) were randomly selected, then a number of teachers (second-stage units or secondary sampling units) were randomly selected from the list of in-scope teachers for each of these schools. The principal in each selected school was asked to complete the principal questionnaire.

### 5.2.2. Target population and survey population

The TALIS programme of surveys (i.e. the TALIS core survey and the options for ISCED levels 1 and 3) aimed to cover all teachers of a given ISCED level in a participating country/territory. Because the programme's identification of policy issues encompassed matters related to classrooms, teachers, schools and school management, all subjects being taught in a school were within the scope of TALIS. As such, the programme's sampling coverage extended to all teachers of an ISCED level and to the principals of the schools in which these teachers were working.

Teachers at a given ISCED level were those who, as part of their regular duties in a target school, provided instruction in programmes at that ISCED level, irrespective of the time spent teaching students of that ISCED level. The TALIS populations of interest also included teachers teaching a mixture of subjects at different levels in a sampled school.

TALIS's international target population restricted the survey to those teachers who taught in "regular" schools and to the principals of those schools. Teachers teaching adults were not part of the international target population and were therefore deemed "out of scope"; teachers working with children with special needs were "in scope" if they taught in regular schools. However, when a school consisted exclusively of these teachers, the school itself was said to be out of scope. Teacher aides, pedagogical support staff (e.g. guidance counsellors, librarians) and health and social support staff (e.g. doctors, nurses, psychiatrists, psychologists, occupational therapists and social workers) were not considered teachers and therefore could not be part of TALIS.

A "principal" was defined as the person with the most responsibility for the administrative, managerial and/or pedagogical leadership at the school. As part of the leadership role, principals might have been responsible for the monitoring of students, the supervision of teachers, contact with parents and guardians,

and/or the planning, preparation and carrying out of the pedagogical work in the school. As principals received the principal questionnaire, they were treated as out of scope for the teacher population, even if they spent some of their time teaching.

For national reasons, participating countries/territories could choose to restrict the coverage of their national implementation of TALIS to a specified part or parts of the country/territory. For example, countries/territories could remove schools deemed difficult to access or where the instruments would have required major modification to work well from the international target population and thereby create a national survey population. Participating countries/territories were encouraged to restrict these exclusions to the greatest extent possible to maintain international comparability of the survey data. A 5% threshold was adopted for TALIS as an upper limit for the overall exclusion of teachers from the survey population. However, because of limitations in the availability of comprehensive and reliable national statistics on enumerations of teachers, validating adherence to this rule proved to be difficult for some participating countries/territories.

Annex C presents the national definitions of the TALIS 2024 target and survey populations for each ISCED level. National project managers (NPMs) provided this information on TALIS sampling forms, templates of which can be found in Annex B.

Ultimately, the TALIS 2024 samples of schools and teachers were selected from the national survey population. Table 5.1 illustrates how the international target population and national survey population related to one another.

**Table 5.1. TALIS 2024 target and survey populations**

| TALIS 2024 out-of-scope                                        | TALIS 2024 international target population<br>=             |                            |           |
|----------------------------------------------------------------|-------------------------------------------------------------|----------------------------|-----------|
|                                                                | all schools where at least one ISCED level X class is found |                            |           |
|                                                                | National exclusions                                         | National survey population |           |
| 1. Schools exclusively for adult education                     | Defined by the country/territory                            | Not sampled                | In sample |
| 2. Schools exclusively for students with special needs         |                                                             |                            |           |
| 3. Substitute or emergency teachers                            |                                                             |                            |           |
| 4. Teachers on long-term leave                                 | Not more than 5% of teachers                                | At least 95% of teachers   |           |
| 5. Teachers exclusively for adult education in regular schools |                                                             |                            |           |

Teachers participating in TALIS were asked whether they were working in any other school and, if so, in how many schools. This information was used during the weighting process to correct for the chance of multiple selection (see the section “Teacher/staff multiplicity adjustment factor” in Chapter 9). Although unlikely, a teacher could have been selected in more than one school. In these instances, teachers were asked to complete a questionnaire for each of the schools from which they were selected.

### 5.2.3. Sample size requirements

Sample sizes for TALIS were determined with two important considerations in mind. First, sample sizes should ensure sufficient precision of the estimated population parameters. Second, they should allow for reliable estimation and modelling, also for sub-groups, while permitting some amount of non-response. In other words, main reporting sub-groups should be based on information collected from a sufficiently large number of individuals.

Regarding sampling precision, the goal of an effective sample size of 400 teachers per country/territory was set, i.e. a precision that would be achieved by selecting 400 teachers with simple random sampling (SRS). An effective sample size of the originally intended 400 teachers results in the following 95% confidence limits for sample estimates of population means, percentages and correlation coefficients.

- Means:  $m \pm 0.1s$  (where  $m$  is the mean estimate and  $s$  is the estimated standard deviation)
- Percentages:  $p \pm 4.9\%$  (where  $p$  is a percentage estimate and  $p = 50\%$ )
- Correlations:  $r \pm 0.1$  (where  $r$  is a correlation estimate and  $r = 0$ ).

As elaborated above, TALIS did not apply SRS but implemented a complex sampling design with several features impacting the precision of estimates. Specifically, TALIS recognised that teachers from one school would be more likely to share opinions and behave in similar ways than teachers across different schools, at least for some of the variables. This tendency for teachers in the same school to be “more alike” than teachers from different schools is called a “clustering effect”. In essence, as the clustering effect becomes larger, the need to select more schools becomes greater to maintain the precision of the estimates evident in a non-clustered sampling design. The clustering effect, together with other features of the sampling design (e.g. stratification, unequal weights), contributes to the design effect. The design effect measures the ratio of the variance within the given sampling design to the variance expected from a simple random sample of the same size (Kish, 1965<sup>[11]</sup>). Those engaged in the preparation work for TALIS used, as a working hypothesis, a design effect of 5.2, based on the results of earlier TALIS cycles. Note, however, that design effects varied greatly across countries/territories, modules and variables, a situation that was indeed evident in the large variance in design effects apparent in TALIS 2024 (see Chapter 9).

To achieve an effective sample of 400 teachers at minimum, allowing for cost-efficiency and sufficiently large sub-groups at the same time, the school sample size was set to 200 schools, and 20 teachers within sampled schools, per country/territory and module (ISCED levels 1, 2 and 3). If there were fewer than 20 teachers in a school, all eligible teachers were selected. The nominal sample therefore comprised a minimum of 4 000 teachers.

**Table 5.2. Establishing the sample size for TALIS 2024 (core survey)**

|                                 |           | Intended sample size | Realised sample size |
|---------------------------------|-----------|----------------------|----------------------|
| Effective sample size           | a         | 400                  | 433                  |
| Design effect                   | b         | 5.2                  | 5.2                  |
| Actual sample size              | c = a x b | 2 080                | 2 252                |
| Teachers per school             | d         | 20                   | 20                   |
| Minimum teacher response (%)    | e         | 75                   | 75                   |
| Minimum response per school     | f = d x e | 15                   | 15                   |
| Number of schools required      | g = c / f | 139                  | 150                  |
| Minimum school non-response (%) | h         | 75                   | 75                   |
| Sample size for schools         | i = g / h | 185                  | 200                  |

Participating countries/territories could choose to augment their national sample by selecting more schools, by selecting more teachers within each selected school, or by increasing both.

In some cases, because the average number of teachers in the schools was lower than the number expected in the international plan, the sampling team maintained a minimum total number of participating teachers by increasing the number of schools to be sampled. Annex D presents the number of selected schools per participating country/territory and module.

#### **5.2.4. National sampling strategies**

The TALIS sampling team in co-operation with the national centres was responsible for developing a sampling design that adhered to the international requirements but also accommodated particular national research interests, if possible. Participating countries/territories could suggest variations to or adaptations

of the international sampling plan to better suit their national needs or conditions. All changes to the international sampling plan had to be reviewed and approved by the sampling team.

### *School sampling frames*

Participating countries/territories were asked to provide the International Association for the Evaluation of Educational Achievement (IEA) Hamburg with a current and complete list of schools educating students at the ISCED level of interest. This list constituted the school sampling frame for TALIS and was expected to correspond to the survey population as defined and described on the sampling forms.

The sampling frame had to contain certain key variables: a national school identifier, a measure of size (preferably the number of teachers at the ISCED level of interest) and values for variables to be used for stratification. Whenever possible, the frame also needed to include the type of funding (private or public) and the type of education stream (academic or vocational).

### *Stratification*

Stratification is part of many sampling designs and entails the grouping of sampling frame units by common characteristics. Examples for such groups of units (schools in the case of TALIS) are different types of schools, geographic regions, urbanisation level or source of funding. TALIS generally used stratification to improve the efficiency of the sample design or to allow disproportional sample allocation for precise sub-group estimation.

The sampling team invited participating countries/territories to discuss stratification strategies with them. If a country/territory required estimates with high precision levels for specific subgroups of interest, the sampling team could select more schools from within specific strata than a proportional sample allocation would have required. Therefore, the participating country/territory and the sampling team together determined how many schools should be selected per stratum. A proportional sample allocation would have reflected the proportions of the population regarding stratum size in the sample. The use of sampling weights made it possible to implement disproportional sample allocations without biasing population estimates.

Stratification could be done explicitly (whereby a fixed portion of the total sample was allocated to the stratum) or implicitly (whereby the variable was used to sort the sampling frame before sample selection, thus giving, on average, a proportional representation of the implicit strata in the sample). Samples for the different explicit strata were completely independent from one another.

Common stratification schemes reflected categories of geographic regions, urbanisation, source of financing, type of settings and language, or a combination of these. Annex D provides stratification details for each participating country/territory and each module in which it participated.

### *Sample selection*

The sampling team at IEA Hamburg selected all school samples.

The most common method used to select the school samples was systematic random sampling with probability proportional to size (PPS) within explicit strata. If implicit stratification was used, schools in explicit strata were sorted by implicit strata. Sampling frames were always sorted by a measure of size (MOS) within explicit and implicit strata prior to sampling; in rare situations, an MOS could not be provided by the country/territory, and a constant value was used. Sorting by MOS was done in a serpentine manner, which meant alternating increasing and decreasing order in each adjacent implicit stratum so that adjacent schools would be of similar sizes even across implicit strata. This method is useful when creating replication zones for estimation of sampling error (see Chapter 9).

The mechanics of systematic random sampling with PPS can be described as follows. Let  $M$  be the sum of all MOS in an explicit stratum, let  $m_i$  be the MOS for school  $i$  in the explicit stratum and  $M_i$  be the cumulative sum of the school sizes up to and including school  $i$ , and let  $n$  be the number of schools to be sampled from that explicit stratum. A sampling interval  $k$  was computed as quotient  $\frac{M}{n}$ , and a random starting point  $d$  (in each stratum) was drawn at such that  $1 \leq d < k + 1$ . The sample was selected by walking steps of fixed length  $k$  along the (ordered) sampling frame. Where the step landed pointed to the school to be added to the sample. The pointer for school  $j$  was calculated by  $\text{int}(d + (j - 1) \times k)$ . This process was completed separately for each explicit stratum.

Whenever possible, two replacement schools for each sampled school – the school just below and the school just above the selected school on the sampling frame sorted by MOS – were assigned. The replacement schools had to come from the same explicit stratum as the sampled school. It was expected that this strategy would help maintain the sample size and minimise non-response biases by using schools with characteristics similar to those of the non-responding schools. Schools selected for the original sample could not be simultaneously selected as a replacement school.

Table 5.3 illustrates how an ordinary spreadsheet can be used to implement systematic random sampling with PPS. In this illustration, Explicit stratum A consists of 12 schools with a total MOS of 209 teachers, and the sample needed from this stratum is  $n = 3$  schools; the sampling interval is  $k = \frac{209}{3} = 69.7$ . Suppose that the random start is  $d = 49$ . Here, for the first selection,  $j = 1$  and the pointer is  $\text{int}(49 + (1 - 1) \times 69.7) = 49$ . In other words, the selected school is the one containing the 49th teacher from a hypothetical comprehensive teacher list. When  $j = 2$ , the pointer is at  $\text{int}(49 + (2 - 1) \times 69.7) = \text{int}(118.7) = 118$ . Finally, the pointer is at  $\text{int}(49 + (3 - 1) \times 69.7) = \text{int}(188.4) = 188$ . The schools that are automatically selected as replacements are the schools immediately below and above a selected school, if available. If the selected school is at the beginning or at the end of the explicit stratum, the replacements might be different ones. In this example, the second replacement for School 12 is the one above the first replacement.

**Table 5.3. Illustration of systematic random sampling with PPS**

| National school ID | Explicit stratum | Implicit stratum | MOS | Cumulative MOS | School selected | Pointer | Selections and replacements |
|--------------------|------------------|------------------|-----|----------------|-----------------|---------|-----------------------------|
| 1                  | A                | 1                | 10  | 10             |                 |         |                             |
| 2                  | A                | 1                | 12  | 22             |                 |         |                             |
| 3                  | A                | 1                | 15  | 37             |                 |         | R2                          |
| 4                  | A                | 1                | 17  | 54             | 1               | 49      | S                           |
| 5                  | A                | 2                | 20  | 74             |                 |         | R1                          |
| 6                  | A                | 2                | 18  | 92             |                 |         |                             |
| 7                  | A                | 2                | 16  | 108            |                 |         | R2                          |
| 8                  | A                | 2                | 16  | 124            | 2               | 118     | S                           |
| 9                  | A                | 3                | 15  | 139            |                 |         | R1                          |
| 10                 | A                | 3                | 17  | 156            |                 |         | R2                          |
| 11                 | A                | 3                | 26  | 182            |                 |         | R1                          |
| 12                 | A                | 3                | 27  | 209            | 3               | 188     | S                           |

Note: S = sampled school; R1 = first replacement; R2 = second replacement.

At the end of the school selection process, the sampling team sent each participating country/territory an Microsoft Excel file that contained the selected schools for the original sample, the replacement schools and a standardised TALIS school identification number.

IEA Hamburg provided each participating country/territory with the IEA Windows Within-School Sampling Software (WinW3S) for selecting the teachers. IEA WinW3S facilitated the creation of teacher sampling frames and the random selection of teachers, thus ensuring compliance with the sample design and the need to furnish complete documentation. The procedure of selecting teachers within schools is described in Chapter 6.

Annex D presents the sizes of the schools and teacher samples for each participating country/territory.

### *Overlap control between modules*

If a country/territory participated in multiple modules at different ISCED levels, overlap control between these modules was used. In general, selecting schools for multiple modules was avoided. Teachers could work at different levels and therefore be part of multiple target populations. However, it was not feasible to let teachers complete multiple questionnaires referring to different ISCED levels they work at. It was also considered not feasible to let principals complete multiple questionnaires for the different levels of their schools. Therefore, a school could generally only be selected for one ISCED level, and only teachers of this ISCED level were then listed and sampled.

Following the requests of two countries/territories, selecting the same schools for two modules was accepted. In this case, the principal had to complete multiple questionnaires. Within schools, the teachers were selected only for one ISCED level.

### *Sampling for the field trial*

Between February and March 2023 and prior to the main survey, each participating country/territory conducted a field trial (FT). The sample of 30 schools needed for the field trial in each country/territory was selected simultaneously with the main survey sample. In practical terms, the first sampling step involved selecting enough schools for both stages. During the second step, schools were sub-sampled from this sample for the field trial. The third and final step was to assign the replacement schools, one for the field trial and two for the main survey.

The simultaneous selection of the school samples for the field trial and the main survey made it possible to control sample overlap: that is, schools were selected for only one phase of the survey. This helped reducing the response burden on participating schools and teachers. Avoiding overlap was possible if the populations were big enough, that is, had more schools than needed for the field trial and the main survey. Overlap occurred in small countries/territories, where all schools had to be selected for the main survey. If schools were selected for the field trial and the main survey at the same time, measures were implemented to ensure that the teachers within these schools only had to participate once in TALIS.

## **5.3. The Teacher Knowledge Survey (TKS)**

The target population for the TKS was identical to the one for the TALIS core survey, i.e. teachers and their principals in ISCED level 2. In case a country/territory chose to participate in the TKS, the same schools were selected to accommodate the TALIS core survey and the TKS. Within the selected schools, 20 teachers were randomly assigned to participate in the TALIS core survey, and 15 teachers were randomly assigned to the TKS. In schools with fewer than 35 teachers, all teachers were selected and distributed proportionally.



## 5.4. TALIS Starting Strong (ISCED level 02 and U3)

The sampling procedures for early childhood education and care (ECEC) settings of ISCED level 02 (pre-primary education for U3 to school-entry children) and for U3 children (U3) were mostly identical to those of the TALIS core survey. Differences are described in the following paragraphs.

### 5.4.1. Target population and survey population

The Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) component aimed to cover all staff providing ECEC for: i) ISCED level 02 children; and ii) U3 children in each participating country/territory. Staff at ISCED level 02 were those who, as part of their regular duties in a target setting, were carrying out pedagogical work, providing learning opportunities or care, in programmes at ISCED level 02, irrespectively of their working hours. Staff for U3 children were those who, as part of their regular duties in a target setting, were carrying out pedagogical work, providing learning opportunities or care, for children in this age range, again irrespectively of their working hours. Staff who were providing learning opportunities or care for both target populations were part of each population of interest.

The international target population restricted the survey to: i) staff who were working in institutional (officially registered) settings providing ECEC; and ii) the leaders in those settings. For U3 children, these settings could be home-based (within the rooms of the respective staff) or centre-based (within rooms specifically dedicated to ECEC). For ISCED level 02, a decision was made to only survey centre-based settings. Staff working with children with special needs were in scope if they were working in “regular settings”. However, settings catering exclusively for children with special education needs were out of scope. Other staff who were out of scope included: short-term substitute staff (to replace staff on sick leave); people involved in informal arrangements within the ECEC setting; volunteers who occasionally came in to provide a special activity; auxiliary staff (e.g. cleaners, cooking staff) who did not interact regularly in a pedagogical manner with the children; and medical and therapeutic staff (e.g. speech therapists, occupational therapists) whose work was primarily non-pedagogical.

An ECEC setting leader was defined as the person with the most responsibility for the administrative, managerial and/or pedagogical leadership in the setting. In line with their leadership role, leaders could be responsible for monitoring children, supervising other staff, maintaining contact with parents and guardians, and/or planning, preparing and carrying out the setting’s pedagogical work. Leaders may have also spent part of their time working with the children. If leaders were also working with children, they were part of the staff population at the same time.

### 5.4.2. Sample size requirements

As for the TALIS core survey, the effective sample was expected to be 400 staff. For TALIS Starting Strong, a design effect of two was assumed, based on experiences from TALIS Starting Strong 2018. The minimum sample size of staff within settings was set to eight staff, acknowledging that most settings across participating countries/territories are small. To allow for reliable estimation and modelling, also for sub-groups, while permitting some amount of non-response, the sample sizes were set to a minimum of 180 settings per module, aiming for a nominal sample size of about 1 200 staff in each country/territory and module. If a setting had fewer than eight staff, all eligible staff were sampled. If many settings had fewer than eight staff, more settings were sampled to achieve the intended nominal sample size.



**Table 5.4. Establishing the sample size for TALIS 2024 (TALIS Starting Strong)**

|                                  |                  |     |
|----------------------------------|------------------|-----|
| Effective sample size            | a                | 400 |
| Design effect                    | b                | 2   |
| Actual sample size               | $c = a \times b$ | 800 |
| Staff per setting                | d                | 8   |
| Minimum staff response (%)       | e                | 75  |
| Minimum response per setting     | $f = d \times e$ | 6   |
| Number of settings required      | $g = c / f$      | 135 |
| Minimum setting non-response (%) | h                | 75  |
| Sample size for settings         | $i = g / h$      | 180 |

### 5.5. Sample characteristics by participating country/territory

The country/territory reports in Annex D provide more details on each set of plans, including population statistics, exclusions, the sampling design and the realised sample.

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## **6** Field operations

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This chapter outlines the procedures and outcomes of the OECD Teaching and Learning International Survey (TALIS) 2024 field operations, focusing on the key responsibilities of national centres. These include contacting schools and early childhood education and care settings, sampling within institutions and monitoring data collection for the International Standard Classification of Education (ISCED) level 2 core survey and other components such as ISCED levels 1 and 3, TALIS Starting Strong and the Teacher Knowledge Survey. The chapter also notes the support provided by the international study centre (ISC) through documents and software to assist national centres. Overall, the administration of TALIS 2024 was deemed highly successful across all participating countries and territories, with no significant issues reported. The field procedures were implemented as instructed by the ISC, and adherence to these procedures was mandatory, with exceptions allowed only under specific conditions approved by the TALIS consortium and the OECD.

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## 6.1. Overview

This chapter provides an overview of the procedures and outcomes of OECD Teaching and Learning International Survey (TALIS) 2024 field operations. It highlights key areas of work within national centres, including contacting schools/early childhood education and care (ECEC) settings, conducting within-school/ECEC setting sampling and monitoring data collection for the level 2 TALIS core survey, as well as any additional International Standard Classification of Education (ISCED) levels (ISCED levels 1 and 3), Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) and the Teacher Knowledge Survey (TKS) included in the TALIS 2024 main survey.

Additionally, the chapter references the documents and software provided by the international study centre (ISC) to support national centres in carrying out these tasks.<sup>1</sup>

The administration of TALIS 2024 across all participating countries/territories was highly successful. No major obstacles were encountered and all field operation procedures, as defined and communicated by the ISC, were effectively implemented.<sup>2</sup>

While the procedures outlined in this chapter primarily focus on the administration of the ISCED level 2 TALIS core survey, they are also applicable to other international survey components, including ISCED levels 1 and 3, TALIS Starting Strong and the TKS. The ISC required all participating countries/territories to adhere to the established standards and procedures, with deviations permitted only in exceptional cases and only if discussed and formally agreed upon with the TALIS consortium and the OECD.

## 6.2. Technical standards, manuals, videos and software

During all phases of the survey, the national centres adhered to the standardised procedures prepared by the ISC and its consortium partners. These procedures were outlined in the following documents, released to the national centres before the field trial and then updated for the main survey (except for the TALIS 2024 General Guidelines for National Project Managers, Survey Operations Procedures (SOP) Unit 1 and the International Quality Observer Manual):

- **TALIS 2024 Technical Standards** – single version, see OECD (2025<sup>[1]</sup>): The consortium, in consultation with the OECD Secretariat, developed a concise, dedicated document outlining the technical standards and guidelines applicable to key planning and operational tasks. Once these standards were adopted by the TALIS Governing Board on 7 July 2022, it was imperative that all participating countries and territories adhered to them. The technical standards covered ten main topics, including survey ethics, confidentiality, survey operations, quality assurance and data management.
- **TALIS 2024 General Guidelines for National Project Managers** (single version): These guidelines were designed to provide national project managers (NPMs) with an overview of TALIS, detailing their responsibilities as well as those of national centres. Additionally, the document outlined key milestones and required deliverables throughout the process.
- **Survey Operations Procedures Unit 1 – Sampling Schools/ECEC Settings** (single version): This manual defined the target population of teachers across all ISCED levels, TALIS Starting Strong and the TKS. It also provided instructions on preparing and implementing a national sampling plan, developing the school/ECEC setting sampling frame and selecting the school/ECEC setting sample.
- **Survey Operations Procedures Unit 2 – Working with Schools/ECEC Settings** (three versions; TALIS core survey, TALIS Starting Strong, TKS): This manual provided guidance on securing and improving the co-operation of schools/ECEC settings, with a strong emphasis on public relations

strategies. It also detailed how to adapt the School/ECEC Setting Co-ordinator Manual to the national context and included instructions on shipping of materials and quality control measures.<sup>3</sup>

- **School/ECEC Setting Co-ordinator Manual** (three versions; TALIS core survey, TALIS Starting Strong, TKS): Designed for school/ECEC setting co-ordinators, this manual served as a key resource for the main point of contact between each school/ECEC setting and the national centre. Typically, the co-ordinator was a teacher/ECEC staff member, principal/ECEC setting leader of the school/ECEC setting participating in TALIS. The manual provided step-by-step instructions for listing and tracking teachers/ECEC staff and managing onsite survey administration. NPMs were solely responsible for adapting and translating the manual into their survey administration language(s) and incorporating relevant national information where necessary.
- **Survey Operations Procedures Unit 3 – Instrument Preparation** (single version): This manual provided national centres with instructions for developing internationally comparable national versions of the released international survey instruments and cover letters. It also detailed the various verification steps – including adaptation, translation and layout – to ensure consistency and accuracy throughout the process.<sup>4</sup>
- **Instructional videos accompanying Survey Operations Procedures Unit 3:** To support national centres in instrument preparation, the ISC released eight instructional videos. These videos provided guidance on key tasks such as verifying that all adaptations had been approved, ensuring all items had been translated, understanding locked items and following the style guide.
- **IEA StudyExpert Manual** (single version): This manual focused on the technical aspects of item and instrument localisation within IEA StudyExpert, a web-based tool for creating, translating and assigning online instruments, with a monitor to track and manage participation rates. The manual served as a comprehensive guide for all required tasks, including adaptation, translation and the extension of both items and instruments.
- **Instrument Assembly Guide** (single version): This document outlined the guidelines for editing instruments, including adding or removing items and inserting new items between existing ones during the assembly process.
- **Survey Operations Procedures Unit 4 – Data Collection and Quality Control** (two versions; TALIS core survey and TKS, TALIS Starting Strong): This document provided national centres with guidance on preparing for and supporting data collection in schools/ECEC settings. It included detailed instructions on listing and conducting within-school/ECEC setting sampling of teachers/ECEC staff, assigning and administering survey instruments, and tracking and monitoring data collection quality.
- **Survey Operations Procedures Unit 5 – Data Capture Procedures** (two versions; TALIS core survey and TKS, TALIS Starting Strong): This document outlined procedures for using the IEA Data Management Expert (DME) software, which was essential for capturing and verifying data from paper questionnaires.
- **National Quality Observer Manual** (two versions; TALIS core survey and TKS, TALIS Starting Strong): This manual provided guidance to NPMs on implementing a national quality observation programme. The procedures aligned closely with those used by international observers; however, NPMs had the flexibility to adapt the manual and procedures according to their specific needs.
- **International Quality Observer Manual** (one version): This manual was developed and distributed directly to the international quality observers, all of whom were contracted by the IEA. It provided detailed guidance on the observers' responsibilities, which included assessing the quality of survey implementation across participating countries/territories. As part of their tasks, the international quality observers conducted interviews with NPMs and school/ECEC setting co-ordinators. They documented the outcomes of these interviews using an online survey tool called the School/ECEC Setting Interview Record.

In addition to providing the operational manuals, videos and documents described above, the ISC released three key software packages to support national centres in the instrument preparation and data collection process:

- **IEA Windows Within-School Sampling Software (WinW3S)** (two versions; TALIS core survey and TKS, TALIS Starting Strong): This software assisted national data managers in preparing listing forms, qualifying and randomly sampling teachers/ECEC staff in selected schools/ECEC settings, and generating tracking forms for sampled individuals. All tracking data were stored in a single database, ensuring that they could later be used to verify the integrity of sampling procedures, assess the completeness of response data and ultimately compute sampling weights and participation rates.
- **IEA Data Management Expert (DME) software** (one version): IEA DME enabled national centre staff to manually enter data from paper questionnaires and conduct various validity checks on the recorded data. It included comprehensive codebooks for each questionnaire, ensuring that all data files adhered to the standard international format (see Chapter 8 for more details).
- **IEA StudyExpert** (one version): The software served as both an item builder and a translation system, facilitating the preparation of instruments for online administration and their assignment to respondents. Designed to be compatible with all modern web browsers and both desktop and handheld devices, it also featured a Participation Monitor component. This function enabled national centres to track participation rates and follow up with schools/ECEC settings in cases of low participation.

During meetings with NPMs, the ISC provided detailed explanations of field operation procedures as outlined in the manuals and guidelines, along with instructions on using the software packages. Representatives from national centres participated in hands-on training sessions to practice the correct handling of the software and its associated procedures. In case of any questions or concerns regarding procedures, guidelines or software during implementation, the ISC remained available to support national centres and assist in finding appropriate solutions.

### 6.3. Administering TALIS 2024

Most participating countries/territories in TALIS 2024 administered the ISCED level 2 TALIS core survey of teachers and their principals. Also, TALIS 2024 offered countries/territories the opportunity to survey ISCED levels 1 and/or 3 as well as to participate in TALIS Starting Strong and/or the TKS. (Table 4.2 in Chapter 4 provides an overview of the distribution of target populations across the participating countries/territories.) If countries/territories opted to administer TALIS at an additional ISCED level, TALIS Starting Strong and/or TKS, the ISC instructed them to prioritise the ISCED level 2 TALIS core survey. This mandate applied to national instrument production as well as to data collection and data processing.<sup>5</sup>

For countries/territories that opted to administer one or more international components, this process added an additional layer of complexity, as it had to be carried out alongside the production of national ISCED level 2 instruments. To support these efforts, the ISC emphasised the importance of adhering to an agreed-upon, individualised survey preparation schedule. These schedules enabled effective progress monitoring, resource planning and a smooth workflow between national centres and the ISC.

The national centres used between three and six months to get all survey instruments and materials ready in time for the start of main survey data collection. Table 6.1 gives an overview of the official main survey data collection windows and the period dedicated to main survey instrument preparation for both hemispheres. If a participating southern hemisphere country/territory conducted (part of) its data collection during the official northern hemisphere data collection period, the instrument preparation period for that

country/territory adhered to the official northern hemisphere preparation timeline (e.g. Columbia, Japan and South Africa for the core survey, Singapore for private schools).

**Table 6.1. Preparation time for main survey instruments**

| Schedule            | Official preparation time for main survey instruments | Official main survey data collection window |
|---------------------|-------------------------------------------------------|---------------------------------------------|
| Northern hemisphere | October to December 2023                              | 1 February to 30 April 2024                 |
| Southern hemisphere | October 2023 to May 2024                              | 1 June to 31 August 2024                    |

For many participating countries/territories, instrument preparation was relatively straightforward, with comfortable timelines, as they chose to administer the ISCED level 2 TALIS core survey in a single national language.

However, the schedules and procedures for Chile and Morocco were particularly complex, as both countries opted to administer the TALIS core survey, along with TALIS Starting Strong and the TKS. Additionally, Morocco surveyed the ISCED level 1 population and participated in TALIS for the first time, requiring them to translate all items from scratch, including trend items.

Spain faced additional challenges, administering the survey in five languages, which led to an intricate and extended adaptation and translation verification process.

#### 6.4. Contacting schools/ECEC settings and within-school/ECEC setting sampling

The IEA's sampling team sent each NPM a selected school sample based on the sampling frames the NPM had already submitted (see Chapter 5 for more details on school/ECEC setting sampling). In order to achieve the highest possible participation rates at the school/ECEC setting level, the sampling team sampled two replacement schools/ECEC settings (assuming such schools/ECEC settings were available) in addition to each originally sampled school/ECEC setting.

Once NPMs received their sample, the national centres began contacting the designated schools/ECEC settings. National centres usually adhered to the technical standards and only contacted their first replacement school/ECEC setting if one of the originally sampled schools/ECEC settings declined participation. If this replacement school/ECEC setting also refused participation, NPMs approached their second replacement school/ECEC setting.

One participating country (Ireland) applied another process to increase the participation rates, namely contacting replacement ECEC settings before the original ECEC settings had confirmed/declined participation. If the original ECEC setting and the replacement ECEC setting both agreed to participate in the survey, the replacement ECEC setting was marked as a national ECEC setting and treated as an additional, self-representing unit carrying a weight; the weights of regularly participating ECEC settings were reduced accordingly. However, because this procedure represented a deviation from Technical Standard 5.5, national ECEC settings were not included during computation of the participation rates, conducted as part of the data adjudication process. Further mention of the adjudication procedure appears in the discussion in Chapter 10 on data adjudication.

National centres administering the survey for one or more target populations had to manage a minimum of 180 ECEC settings and 200 schools per target population. As a result, these national centres needed to carefully plan their resources to meet the demands of multiple tasks associated with the survey's complex design.

To streamline survey administration, most participating countries/territories required each school/ECEC setting to appoint a co-ordinator responsible for overseeing all TALIS-related tasks. In 46 countries/territories, principals/ECEC setting leaders, members of the management team and teachers/ECEC staff took on this role. Among them, 12 countries/territories reported that other personnel – such as administrative staff, state or governmental officials, district staff or county inspectors – were assigned as school/ECEC setting co-ordinators. Additionally, ten national centres noted that teachers/ECEC staff filled the role exclusively, while one national centre opted to hire an external agency for these responsibilities.

Close collaboration between school/ECEC setting co-ordinators and national centres was essential throughout the teacher/ECEC staff listing, sampling and survey administration processes. To facilitate effective communication, several countries and territories established dedicated hotlines, special email accounts, websites or online platforms.

#### **6.4.1. Identification number, listing and tracking forms**

Information about teachers/ECEC staff was gathered via the listing forms (TLF) and tracking form (TTF); see Annex E for more information on these two forms). National centres used the IEA WinW3S software to produce the forms. IEA WinW3S created hierarchical four-digit identification numbers that uniquely identified the sampled schools/ECEC settings within each participating country/territory. This number was also the identification code assigned to the person answering the principal/leader questionnaire. Teacher/ECEC staff identification codes were derived from the school/ECEC setting codes by adding two additional digits at the end of the school/ECEC setting identifier, a process that created a hierarchical link between schools/ECEC settings and teachers/ECEC staff.<sup>6</sup>

In accordance with the instructions in the School/ECEC Setting Co-ordinator Manual, co-ordinators listed the eligible teachers/ECEC staff members and their names, followed by a sequential number, exemption, year of birth, gender, main subject domain (TALIS core survey), leader and staff role (TALIS Starting Strong). Almost one-third of the NPMs reported that data protection/confidentiality laws and rules prevented them from providing teacher/ECEC setting staff names. These participating countries/territories therefore used only numbers or codes.

The national centres entered information from the TLFs into IEA WinW3S, which then drew the random within-school sample of 20 teachers per school and 8 ECEC staff members per ECEC setting.<sup>7</sup> After completion of the within-school/ECEC setting sampling, IEA WinW3S created TTFs that listed all sampled teachers/ECEC staff. The national centres sent the TTFs to schools/ECEC settings so school/ECEC setting co-ordinators knew which teachers/ECEC staff should receive which instruments.

The TTFs were also used to document the participation status of the sampled teachers/ECEC staff and therefore included teacher/staff names, teacher/staff ID, year of birth, gender, main subject domain (TALIS core survey), leader and staff role (TALIS Starting Strong) and administration mode (online/paper). Furthermore, each TTF contained a column that allowed the school/ECEC setting co-ordinators to document the questionnaire return status for paper questionnaires.

The national centres sent copies of the TTFs including teacher/staff IDs but no teacher/staff names to the ISC. Since names on the TTFs were cut off, all names were kept confidential.

#### **6.4.2. Assigning instruments to teachers/ECEC staff and principals/ECEC setting leaders**

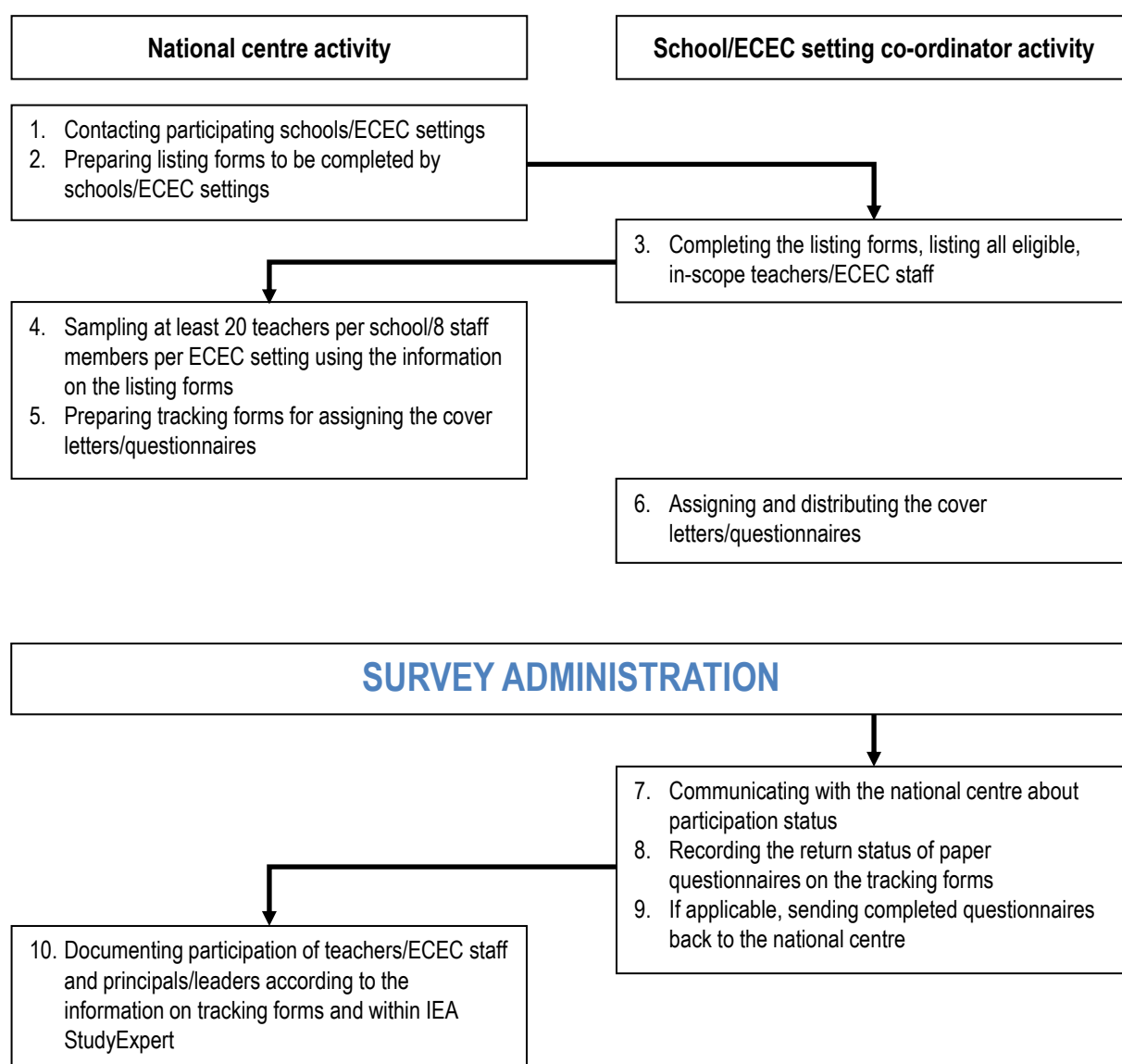
Each principal/ECEC setting leader was asked to complete a principal/leader questionnaire. The school/ECEC setting co-ordinator assigned the teacher/ECEC setting staff questionnaire to each teacher/ECEC staff listed on the TTFs (see Chapter 5 for more details on school sampling).



National centres sent a package containing all cover letters for online administration, paper questionnaires (where applicable), OECD data protection notice, TTFs, and any other relevant supplies to schools/ECEC settings. To address confidentiality concerns during paper administration, several countries/territories chose to provide teachers/ECEC staff with pre-paid envelopes so they could send their completed questionnaires directly to their respective national centre rather than handing them to the school/ECEC setting co-ordinator.

Figure 6.1 outlines the different responsibilities of and co-operation between the national centres and school/ECEC setting co-ordinators.

**Figure 6.1. Responsibilities of national centres and school/ECEC setting co-ordinators**



## 6.5. Administering the questionnaires and conducting national quality observations

The ISC requested each participating country/territory to select its own timeframe for survey administration within the designated international data collection period.

For countries and territories in the northern hemisphere, the international data collection period for the main survey was set from 1 February to 30 April 2024, with ten participants extending into May 2024, seven participants into June 2024, one participant continuing until July 2024 and one participant into August 2024.

For the southern hemisphere, the data collection period was scheduled from 1 June to 31 August 2024, with two participants extending into September 2024.

National centres were required to discuss any deviations from these timeframes with the ISC and obtain approval from both the ISC and the OECD. The main reason for extending the data collection period was in improving the participation rates of respondents and schools/ECEC settings.

Table 6.2 provides an overview of the originally planned data collection periods, any modifications made and instances where data collection extended beyond the internationally set timeframes. Some national centres opted to extend their data collection period to improve participation rates, either by starting earlier or finishing later than initially scheduled. As a result, data collection durations varied significantly, ranging from 15 days to nearly 6 months.

**Table 6.2. Originally planned and actual data collection windows**

| Country/territory                                             | Planned start of data collection window | Planned end of data collection window | Actual start of data collection window | Actual end of data collection window |
|---------------------------------------------------------------|-----------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|
| Albania                                                       | 11-Mar-24                               | 12-Apr-24                             | 11-Mar-24                              | 15-Apr-24                            |
| Alberta (Canada)                                              | 05-Feb-24                               | 19-Apr-24                             | 01-Mar-24                              | 14-Jun-24                            |
| Australia                                                     | 03-Jun-24                               | 31-Jul-24                             | 03-Jun-24                              | 19-Aug-24                            |
| Austria                                                       | 18-Mar-24                               | 05-May-24                             | 18-Mar-24                              | 02-May-24                            |
| Azerbaijan                                                    | 01-Feb-24                               | 30-Apr-24                             | 01-Feb-24                              | 02-Apr-24                            |
| Bahrain                                                       | 04-Feb-24                               | 31-Mar-24                             | 04-Feb-24                              | 02-Apr-24                            |
| Brazil                                                        | 03-Jun-24                               | 12-Jul-24                             | 03-Jun-24                              | 31-Jul-24                            |
| Bulgaria                                                      | 12-Feb-24                               | 22-Mar-24                             | 12-Feb-24                              | 26-Mar-24                            |
| Chile                                                         | 03-Jun-24                               | 26-Aug-24                             | 24-Jun-24                              | 17-Sep-24                            |
| Colombia, <i>TALIS core survey</i>                            | 01-Mar-24                               | 31-May-24                             | 01-Mar-24                              | 26-Aug-24                            |
| Colombia, <i>TALIS Starting Strong</i>                        | 01-Apr-24                               | 02-Aug-24                             | 02-Apr-24                              | 23-Aug-24                            |
| Costa Rica                                                    | 03-Jun-24                               | 30-Aug-24                             | 01-Jun-24                              | 12-Aug-24                            |
| Croatia                                                       | 05-Feb-24                               | 31-Mar-24                             | 05-Feb-24                              | 08-Apr-24                            |
| Cyprus                                                        | 04-Mar-24                               | 30-Apr-24                             | 26-Feb-24                              | 08-Apr-24                            |
| Czechia                                                       | 26-Feb-24                               | 12-Apr-24                             | 04-Mar-24                              | 15-Apr-24                            |
| Denmark                                                       | 01-Feb-24                               | 29-Apr-24                             | 01-Feb-24                              | 06-May-24                            |
| Estonia                                                       | 12-Feb-24                               | 29-Mar-24                             | 12-Feb-24                              | 02-Apr-24                            |
| Finland                                                       | 18-Mar-24                               | 30-Apr-24                             | 18-Mar-24                              | 13-May-24                            |
| Flemish Community (Belgium), <i>TALIS core survey</i>         | 20-Feb-24                               | 30-May-24                             | 26-Feb-24                              | 10-Jun-24                            |
| Flemish Community (Belgium), <i>TALIS Starting Strong, U3</i> | 20-Feb-24                               | 15-Apr-24                             | 24-Feb-24                              | 31-May-24                            |

| Country/territory                                                   | Planned start of data collection window | Planned end of data collection window | Actual start of data collection window | Actual end of data collection window |
|---------------------------------------------------------------------|-----------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|
| Flemish Community (Belgium), <i>TALIS Starting Strong, ISCED 02</i> | 20-Feb-24                               | 30-May-24                             | 27-Feb-24                              | 10-June-24                           |
| France                                                              | 05-Feb-24                               | 26-Apr-24                             | 05-Feb-24                              | 26-Apr-24                            |
| French Community (Belgium)                                          | 18-Mar-24                               | 21-Apr-24                             | 18-Mar-24                              | 22-Apr-24                            |
| Germany                                                             | 01-Feb-24                               | 30-Apr-24                             | 05-Feb-24                              | 13-Jun-24                            |
| Hungary                                                             | 04-Mar-24                               | 12-Apr-24                             | 04-Mar-24                              | 15-Apr-24                            |
| Iceland                                                             | 01-Feb-24                               | 30-Apr-24                             | 01-Feb-24                              | 22-May-24                            |
| Ireland                                                             | 01-Feb-24                               | 30-Apr-24                             | 01-Feb-24                              | 21-May-24                            |
| Israel                                                              | 01-Feb-24                               | 14-Apr-24                             | 01-Feb-24                              | 20-Jun-24                            |
| Italy                                                               | 11-Mar-24                               | 16-Apr-24                             | 11-Mar-24                              | 23-Apr-24                            |
| Japan, <i>TALIS core survey</i>                                     | 19-Feb-24                               | 15-Mar-24                             | 19-Feb-24                              | 29-Apr-24                            |
| Japan, <i>TALIS Starting Strong</i>                                 | 01-Jul-24                               | 22-Jul-24                             | 01-Jul-24                              | 09-Aug-24                            |
| Kazakhstan                                                          | 05-Feb-24                               | 15-Mar-24                             | 21-Feb-24                              | 19-Mar-24                            |
| Korea                                                               | 20-May-24                               | 17-Jun-24                             | 27-May-24                              | 11-Jul-24                            |
| Kosovo                                                              | 11-Mar-24                               | 15-Apr-24                             | 11-Mar-24                              | 22-Apr-24                            |
| Latvia                                                              | 15-Feb-24                               | 30-Mar-24                             | 15-Feb-24                              | 02-Apr-24                            |
| Lithuania                                                           | 12-Feb-24                               | 08-Mar-24                             | 12-Feb-24                              | 18-Mar-24                            |
| Malta                                                               | 01-Feb-24                               | 23-Feb-24                             | 01-Feb-24                              | 18-Mar-24                            |
| Montenegro                                                          | 01-Mar-24                               | 30-Apr-24                             | 22-Apr-24                              | 14-Jun-24                            |
| Morocco                                                             | 15-Apr-24                               | 23-Apr-24                             | 06-May-24                              | 21-May-24                            |
| Netherlands                                                         | 01-Feb-24                               | 30-Apr-24                             | 01-Feb-24                              | 05-Jul-24                            |
| New Brunswick (Canada)                                              | 19-Feb-24                               | 31-Mar-24                             | 19-Feb-24                              | 27-May-24                            |
| New Zealand                                                         | 03-Jun-24                               | 29-Aug-24                             | 03-Jun-24                              | 10-Sep-24                            |
| North Macedonia                                                     | 10-Feb-24                               | 10-Mar-24                             | 10-Feb-24                              | 08-Apr-24                            |
| Norway                                                              | 01-Feb-24                               | 26-Apr-24                             | 05-Feb-24                              | 16-May-24                            |
| Poland                                                              | 01-Mar-24                               | 30-Apr-24                             | 01-Mar-24                              | 22-Mar-24                            |
| Portugal                                                            | 05-Feb-24                               | 15-Apr-24                             | 12-Feb-24                              | 23-Apr-24                            |
| Quebec (Canada)                                                     | 19-Feb-24                               | 31-Mar-24                             | 19-Feb-24                              | 27-May-24                            |
| Romania                                                             | 01-Mar-24                               | 29-Mar-24                             | 01-Mar-24                              | 02-Apr-24                            |
| Saudi Arabia                                                        | 03-Mar-24                               | 14-Mar-24                             | 03-Mar-24                              | 22-Mar-24                            |
| Serbia                                                              | 26-Feb-24                               | 05-Apr-24                             | 26-Feb-24                              | 12-Apr-24                            |
| Shanghai (China)                                                    | 01-Apr-24                               | 30-Apr-24                             | 01-Apr-24                              | 30-Apr-24                            |
| Singapore, <i>private schools</i>                                   | 15-Apr-24                               | 17-May-24                             | 15-Apr-24                              | 17-May-24                            |
| Singapore, <i>public schools</i>                                    | 08-Jul-24                               | 23-Aug-24                             | 08-Jul-24                              | 27-Aug-24                            |
| Slovak Republic                                                     | 19-Feb-24                               | 08-Mar-24                             | 19-Feb-24                              | 18-Mar-24                            |
| Slovenia                                                            | 01-Mar-24                               | 05-Apr-24                             | 01-Mar-24                              | 13-May-24                            |
| South Africa                                                        | 13-May-24                               | 14-Jun-24                             | 13-Jun-24                              | 05-Aug-24                            |
| Spain                                                               | 01-Feb-24                               | 31-Mar-24                             | 01-Feb-24                              | 02-Apr-24                            |
| Sweden                                                              | 01-Feb-24                               | 31-Mar-24                             | 01-Feb-24                              | 02-Apr-24                            |
| Türkiye                                                             | 26-Feb-24                               | 29-Mar-24                             | 18-Mar-24                              | 22-Apr-24                            |
| United Arab Emirates                                                | 05-Feb-24                               | 29-Mar-24                             | 23-Feb-24                              | 03-May-24                            |
| United States of America                                            | 12-Feb-24                               | 29-Apr-24                             | 05-Mar-24                              | 28-Jun-24                            |
| Uzbekistan                                                          | 12-Feb-24                               | 16-Mar-24                             | 22-Mar-24                              | 29-Apr-24                            |
| Viet Nam                                                            | 15-Mar-24                               | 30-Mar-24                             | 28-Mar-24                              | 12-Apr-24                            |

To maintain high survey standards, the ISC expected the national centres to run a national quality observation programme. The ISC provided a manual template for national quality observers (NQOs); however, the design of the national quality observation programme was at the discretion of each country/territory.

It was expected that national centres appoint NQOs, recruited by and directly reporting to the NPMs. Most countries/territories chose national centre staff to implement the NQO programme. Others appointed external personnel, such as professionals in the field of education, researchers experienced in large-scale assessments, ministry officials and – specifically for the TALIS core survey – retired teachers. After the TALIS main survey data collection, NPMs reported the outcomes of the national quality observations in the survey activities questionnaire. Chapter 7 provides a discussion of these outcomes as well as information on the international quality observation programme, organised by IEA Amsterdam.

## 6.6. Monitoring the online questionnaires

National centres monitored completion of the online questionnaires (see Chapter 8 for more details), and NPMs communicated the completion status to school/ECEC setting co-ordinators. Countries/territories were free to manage this procedure according to their needs. Most national centres preferred regular email and/or telephone communication with school/ECEC setting co-ordinators. Other national centres contacted respondents directly using email or instant messaging or created national TALIS websites where school/ECEC setting co-ordinators could log on individually to access all necessary information.

The participation rate estimation tool kept data managers up to date on their current participation rate according to the returned paper questionnaires and/or submitted online questionnaires.

After data collection, each national centre exported the questionnaire data availability status from IEA StudyExpert. National centre personnel then imported this participation information as well as the participation information from IEA DME for the paper questionnaires (where applicable) into IEA WinW3S, a practice that enabled the national centres to verify the participation status of each sampled respondent. National centres were mandated to verify participation before they submitted data to the consortium, a process that all TALIS countries/territories completed successfully.

## 6.7. Preparing for data entry

The major tasks for NPMs immediately after main survey data collection included retrieving and collating the TTFs and paper questionnaires (where applicable) from schools/ECEC settings and verifying their integrity. After receiving the TTFs and questionnaires from schools/ECEC settings, NPMs:

- reviewed that they had received complete and appropriate cover letters/questionnaires for every teacher listed on the TTF
- verified that all identification numbers on all cover letters/questionnaires were accurate and legible
- checked that the participation status recorded on the TTFs matched the availability of questionnaires, the information on the paper questionnaires and the information in the Participation Monitor
- followed up with schools/ECEC settings that did not return all paper questionnaires or returned forms with incomplete or inconsistent information.

National centres recorded all necessary information about schools/ECEC settings, principals/leaders and teachers/ECEC staff, as well as the return status of the questionnaires in IEA WinW3S. NPMs then prepared the paper questionnaires and corresponding forms for data entry (see Chapter 8).

## References

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## Notes

<sup>1</sup> The ISC prepared software packages for sampling, online data collection, data entry and data processing to fit the needs of TALIS. The ISC requested that all participating countries/territories use solely the IEA software to perform the survey; no exceptions were allowed.

<sup>2</sup> With the survey activities questionnaire, administered during the field trial and again during the main survey, the ISC collected NPMs’ feedback on their experiences administering TALIS 2024. The outcomes of the Field Trial Activities Questionnaire were considered in terms of improvements to the main survey’s procedures and the software in use. The outcome of the main survey questionnaire was incorporated into this chapter.

<sup>3</sup> Materials are defined as all documents, forms, brochures, incentives (if applicable), etc. that are sent to schools/ECEC settings in advance of the data collection period.

<sup>4</sup> Instruments refer to the various questionnaires administered to different target populations within the TALIS 2024 context.

<sup>5</sup> If a participating country/territory administering one or more of the TALIS components was struggling with low participation rates during the survey, the national centre was requested to first focus on the TALIS core survey.

<sup>6</sup> An exception occurred for ECEC setting leaders with staff duties who were assigned six-digit identification numbers for the Combined Questionnaire Main.

<sup>7</sup> National centres were given the opportunity to sample more than the recommended 20 eligible teachers per school, and 8 ECEC staff members per ECEC setting, if desired.

# 7

## Quality control: International and national quality observations

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This chapter presents the multi-tiered quality control strategy implemented during the OECD Teaching and Learning International Survey (TALIS) 2024 main survey. The programme included international and national quality observations, additional respondent-level quality control questions and a post-survey questionnaire completed by national project managers. Independent international quality observers monitored adherence to survey procedures, reviewed co-ordinator manuals and conducted interviews with school and early childhood education and care (ECEC) setting co-ordinators. National quality observations complemented this effort, documenting local implementation practices. Additional quality control questions embedded in the survey captured respondents' experiences. Overall, findings confirmed high compliance with international standards and highlighted areas for refinement in future TALIS cycles.

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## 7.1. General overview

This chapter describes the quality control programme developed and implemented for administration of the OECD Teaching and Learning International Survey (TALIS) 2024. The same programme was implemented across all components of TALIS: the TALIS core survey for teachers at International Standard Classification of Education (ISCED) levels 1, 2 and 3, the Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) and the Teacher Knowledge Survey or TKS. Assuring the quality of the collected data was a four-part process, comprising: i) an international quality control programme overseen by the International Association for the Evaluation of Educational Achievement (IEA) Amsterdam and designed to document the procedures for survey preparation and administration during the main survey data collection; ii) additional quality control questions put to respondents at the end of the TALIS 2024 questionnaires; iii) a national quality control programme carried out by national centres; and iv) a follow-up online survey activities questionnaire (SAQ) asking national project managers (NPMs) to comment on the implementation of the TALIS main survey procedures in their respective countries/territories.

A quality control programme in survey administration is very important for ensuring valid comparisons of survey results across countries/territories. Not only does it help document the quality of survey administration and the adherence to technical standards and survey administration guidelines and procedures in each participating country/territory, it also helps to identify issues that could influence the quality and comparability of the data.

Overall, the information collected by the international quality control programme by international quality observers (IQOs), together with the information shared by NPMs via the SAQ, as well the data collected from the additional quality control questions, showed that most countries/territories closely followed the international survey procedures.

Data from the international quality control programme and the SAQ suggest that respondents generally had few problems with the survey. Any issues or concerns regarding survey administration procedures and how to resolve these were shared between the national centres and the TALIS consortium. The quality of the implementation of the TALIS 2024 data collection procedures was well documented, mostly by quality observers at the international level. Data reflected stable and consistent data collection processes across participating countries/territories. In addition, the importance of effective communication in facilitating international project work and supporting project completion was, once again, highlighted, setting the stage for attainable success during future TALIS cycles.

## 7.2. Quality control in survey administration

During TALIS 2024, considerable effort went into developing standardised materials and procedures that ensured the data collected in each country/territory were internationally comparable to the greatest extent possible. More specifically, this standardisation process ensured that survey materials were administered to participants under comparable survey conditions for comparable analysis, across all countries/territories and languages, and for each mode of administration (i.e. online and/or paper data collection). Quality control was implemented at different levels and stages during instrument production, administration, and data entry and processing to document the extent to which each country/territory implemented the standard operating procedures.



This chapter describes the outcomes of the quality control activities conducted during the main survey data collection. Quality control consisted of four major parts:

- IEA Amsterdam designed and managed a standardised, international quality control programme to review and verify that main survey procedures adhered to the TALIS 2024 Technical Standards. International quality control, carried out by the IQOs, was implemented for the main survey only.
- During both the field trial and main survey, quality control questions were administered to a randomly selected subsample of survey respondents (20%) at the end of the questionnaire. These questions were intended to elicit relevant information directly from online respondents about their perceptions of TALIS 2024 and adherence to standardised procedures across participating countries/territories. The questions were tested during the field trial and modified for the main survey prior to implementation.
- An SAQ was submitted to NPMs after administration of the main survey data collection. The questionnaire elicited information about the NPMs' experiences in preparing for and conducting the TALIS 2024 data collection and the extent to which everyone involved followed procedures and guidelines. It also provided NPMs with an opportunity to give feedback on all aspects of survey administration. Information pertaining to the national quality control programmes was also reported in the SAQ and is presented later in this chapter.
- The TALIS consortium required the NPMs to implement national data collection quality observations (i.e. a national quality control programme made up of school visits) during both the field trial and the main survey. The design of the national quality observation programme was nevertheless at the discretion of each participant. The international study centre (ISC) provided a National Quality Observer Manual template that national centres could adapt to suit their contexts and use as a basis for training their national quality observers (NQOs).

During TALIS 2024, countries/territories could administer international components in addition to the TALIS core ISCED level 2 population, namely ISCED levels 1 and 3 and the TKS. Also, countries/territories could administer TALIS Starting Strong at ISCED level 02, for the under 3 (U3) population, or for both ISCED level 02 and U3. The sampled populations (and instruments) applicable to participants featured in the design of the quality control programme and were proportionally included in the schools selected for international quality observations in each country/territory. The TALIS consortium advised NPMs to adopt a similar approach with respect to national quality control.

### 7.3. International quality observation programme

As part of the OECD TALIS 2024 quality assurance process, IEA Amsterdam developed and implemented a standardised international quality control programme to monitor and document the survey administration and data collection activities in the participating countries/territories.

As part of the programme, IEA Amsterdam, in collaboration with the NPM, appointed an IQO in each participating country/territory to carry out relevant tasks within that country/territory. IQOs collected data before and during TALIS 2024 administration and had three main tasks, through which they were able to collect relevant information on how the survey was implemented.

1. **Visit the national centre for their country/territory, to meet and interview the NPM and collect specific materials.** Completing this task required:
  - Interviewing the NPM about TALIS 2024 activities and record their findings in an online NPM interview record.
  - Working with the NPM in the random selection of a subset of schools/early childhood education and care (ECEC) settings (approximately 10%) in view of interviewing the co-ordinators about

- TALIS administration activities, which was then shared and approved by IEA Amsterdam before schools/ECEC setting co-ordinators could be contacted.
- Collecting specific materials needed for national centres to conduct the survey, including the School/ECEC Setting Co-ordinator Manual (for one or more components/ISCED levels/ languages depending on the country/territory).
2. **Review selected sections of the School/ECEC Setting Co-ordinator Manual(s).** Completing this task required:
- Comparing selected sections of the national version(s) of School/ECEC Setting Co-ordinator Manuals against the English international version and documenting any substantial differences across these.
  - In cases where the English source text was altered or adapted (as required by the ISC), providing a rough English backtranslation of the national text.
  - Reporting their findings by completing an online form.
3. **Conduct 20 online interviews per administered component (20 for TALIS Starting Strong and/or 20 for the TALIS core survey/TKS) with the school/ECEC setting co-ordinators of selected schools/ECEC settings.** Completing this task required:
- Interviewing the school/ECEC setting co-ordinator about TALIS 2024 activities prior to and during survey administration.
  - If applicable, splitting interviews across the participating ISCED levels for each component.
  - Recording interview responses on the online co-ordinator interview record.

### **7.3.1. Selection and training of international quality observers**

A critical component of the programme was the recruitment and appointment of independent IQOs, whose primary responsibility was to monitor survey administration and data collection activities in participating countries/territories. Prior to the survey administration period, IEA Amsterdam either proposed a candidate to the NPM or requested the NPM to nominate two potential individuals for the IQO role within their country/territory.

IQOs were often selected from a pool of observers who had previously served in this capacity for other studies managed by the ISC. In these instances, the NPM was asked to confirm their agreement with the suggested candidate or, if they disagreed, to provide two alternative nominations. For countries/territories where no existing candidate was available, the NPM was required to submit nominations directly to IEA Amsterdam.

Regardless of prior experience with quality control programmes for prior studies, all IQO candidates needed to fulfil the following requirements:

- proficiency in English (spoken and written) as well as the main language of administration for their country/territory
- experience with filling in online forms or questionnaires
- independence from the national centre responsible for the study within their country/territory
- experience and knowledge about the educational system within their country/territory
- experience in quality-control-related activities in the field of education (for new candidates, as an asset).

Examples of suitable candidates included school inspectors, ministry officials, retired teachers or principals.

Upon selection of the IQOs, an online training took place to inform them about their tasks and responsibilities within the programme. Training sessions were tailored to the respective survey administration timelines: IQOs in Northern Hemisphere countries/territories (NH) were trained before the start of survey administration in their countries/territories (end of January 2024), while Southern Hemisphere (SH) IQOs received their training before the start of survey administration in SH countries/territories (end of April 2024). In addition to the online training, the following materials were provided to support their work:

- the International Quality Observer Manual, which outlined the IQO tasks and responsibilities
- the school/ECEC setting selection record for co-ordinators interviews, where the settings selection would be included and shared with IEA Amsterdam for approval
- the NPM interview record, with an outline of the questions to be asked to the NPM
- the NPM visit form, for IQOs to list expected travel to visit the NPM
- the co-ordinator manual check (for TALIS Starting Strong, TALIS core survey and/or the TKS), where differences between the international and national version of the materials could be flagged
- the co-ordinator interview script (both for schools and ECEC settings)
- international versions of the co-ordinator manuals (for TALIS Starting Strong, TALIS core survey and/or the TKS)
- slides and recordings from the training sessions.

To manage the expected workload and to complete their responsibilities within the survey administration period, IQOs had the option to recruit assistants. The IQOs were responsible for training assistants and co-ordinating the international quality control activities within the respective country/territory. All communication with IEA Amsterdam remained the responsibility of IQOs, as assistants were not expected to interact directly with IEA Amsterdam.

### **7.3.2. NPM visit and interview outcomes**

IQOs' first task was to visit the national centre to interview the NPM and collect specific materials. IQOs were required to visit the NPM at least ten working days prior to the beginning of the survey, thus providing sufficient time to identify and address any potential issues that could impact the survey's administration. In cases where the visit to the national centre could not be completed within a single working day, IQOs had the option to conduct an online interview with the NPM and request the necessary materials digitally.

The NPM interview collected information from the national centre regarding:

- the coverage of TALIS in traditional/social media
- attitudes among teachers/staff or the general educational community about the TALIS survey
- applicability of the teachers'/leaders'/staff's definitions to the national context
- exclusions that took place prior to the survey
- schools'/ECEC settings' refusal to participate in the survey
- how helpful the international version of the co-ordinator manual was (and if this was adjusted)
- any other activities that supported the co-ordinator manual, to train the co-ordinators in their duties.

#### *Communication about TALIS 2024 and perceptions*

In half of the participating countries/territories, TALIS was mentioned or discussed in traditional and/or social media. Key messages often highlighted the importance of the TALIS survey, recognised the contributions of teachers and staff, and emphasised the value of understanding teachers' and staffs' views and job satisfaction. In some countries/territories, the focus was on advocating for improved conditions for

teachers and ECEC staff based on survey findings or showcasing the significance of comparative results from an international perspective.

When NPMs were asked about the attitudes of the educational community or teachers/staff towards the survey, more than half of the countries/territories reported positive perceptions (Table 7.1). The remaining responses were primarily neutral or unknown.

**Table 7.1. Perceptions of TALIS 2024**

|                                                                                             | Positive | Negative | Neutral | Unknown |
|---------------------------------------------------------------------------------------------|----------|----------|---------|---------|
| Perception of education community (e.g. education researchers, policy makers) of TALIS 2024 | 38       | 1        | 12      | 6       |
| Perception of teachers/staff (target population) of TALIS 2024                              | 30       | 4        | 18      | 5       |

Note: Throughout the report, we will refer to 56 countries/territories and 1 country that participated through the IEA. The Flemish and French Communities of Belgium have been administered as two different territories with two NPMs. Data were collected for Belgium as a whole and can also be analysed for the two territories. NPMs from 56 countries/territories and 1 territory that participated through the IEA were interviewed for TALIS 2024.

In cases where perceptions were positive, NPMs noted that teachers and staff appreciated the opportunity to share their experiences through the TALIS survey and to acknowledge shared challenges. Other members of the educational community viewed TALIS as an excellent opportunity to contribute to global education research and support evidence-based decision-making processes.

Where perceptions were reported as negative, concerns included the lack of immediate, tangible benefits for participation, disruption to daily tasks and the perceived tediousness of the questionnaire. Some educators also expressed concerns about the anonymity of their responses and potential repercussions, as well as scepticism regarding the validity and utility of comparing results with other countries/territories.

### *Definitions of teachers, leaders and ECEC staff*

As part of the survey administration and preparation activities, NPMs were also asked to elaborate on the applicability of the definitions for teachers, leaders and ECEC staff that were included in the international version of the School/ECEC Setting Co-ordinator Manual. These definitions, and the comparisons to the international guidelines, were essential to ensure that school/ECEC setting co-ordinators correctly selected the teachers/staff eligible for TALIS.

The definition of teachers in countries/territories participating in the TALIS core survey was found to be helpful and applicable in 47 out of the 54 cases (Table 7.2). In instances where the definition was challenging to apply, countries/territories reported that difficulties arose from changes in educational systems aimed at increasing inclusivity in the profiles of individuals working in schools. These changes complicated the identification of the target population. Examples included special needs educators supporting teachers in inclusive classrooms or other specialists involved in daily lessons.

**Table 7.2. Definition of the target population and applicability**

|                                                                      | Yes | No |
|----------------------------------------------------------------------|-----|----|
| Applicability of the teacher's definition (TALIS core survey)        | 47  | 7  |
| Applicability of the ECEC staff's definition (TALIS Starting Strong) | 11  | 5  |
| Applicability of the leader's definition (TALIS Starting Strong)     | 14  | 2  |

Note: Sixteen out of 56+1 countries/territories participated in TALIS Starting Strong for 2024.

For TALIS Starting Strong countries/territories, a slightly higher number of difficulties were reported in applying the definition of ECEC staff compared to teachers, although 11 out of 16 of the participating countries/territories still found the definition applicable. Countries/territories that faced challenges with defining ECEC staff cited issues such as variations in the extent of pedagogical work performed by certain employees and distinguishing these from other staff within the setting.

More difficulties were reported with the definition of leaders, with 14 out of 16 NPMs indicating challenges in applying these definitions within their country/territory. When issues arose, they mainly concerned cases involving leaders in settings who were not directly engaged in work with children.

### *Exclusions prior to sampling and participation refusal*

Twenty-eight out of the 57 interviewed NPMs reported that some exclusions prior to the sampling took place within their country/territory. Most of these referred to exclusions that took place during the field trial in consultation with the ISC, but not for the main survey. Cases where exclusions took place referred to the number of students or teachers being too small, schools/ECEC settings being affected by natural catastrophes or schools that did not follow the national curriculum (such as international or foreign language schools).

By the time the NPM interviews took place, 37 countries/territories reported that some schools or ECEC settings had refused to participate.<sup>1</sup> NPMs indicated that, in most cases, the decision to decline participation was attributed to factors such as high workload in schools and settings, resource shortages, the implementation of other internal surveys aimed at understanding teachers' or staff situations, or the perception that schools and settings already had a sufficient understanding of educators' circumstances. Additionally, some schools and settings expressed reluctance to participate in a survey conducted by government bodies or relevant evaluation institutions due to dissatisfaction with these organisations.

### *The School/ECEC Setting Co-ordinator Manual and support materials*

Lastly, NPMs were also asked to report on their impressions about the international version of the co-ordinator manual, how helpful these were, as well as if these were accompanied by other types of activities (such as online or in-person training sessions or provision of additional support materials).

As shown in Table 7.3, 36 countries/territories found the manual to be useful. However, in cases where the manual was deemed only somewhat useful, NPMs mentioned that the manual was too extensive and occasionally difficult to adapt to the national context of individual countries/territories.

**Table 7.3. NPM perception of the co-ordinator manual**

|                                                                               | Useful | Somewhat useful | Not useful |
|-------------------------------------------------------------------------------|--------|-----------------|------------|
| How useful did you find the international version of the co-ordinator manual? | 36     | 19              | 2          |

Note: NPMs from 56 countries/territories and 1 territory that participated through the IEA, were interviewed for TALIS 2024.

To address these limitations (as described in School/ECEC Setting Co-ordinator Manual reviews), some countries/territories implemented structural changes, such as dividing the manual into separate documents or creating supplementary materials, including videos and pamphlets, containing the same information. These adaptations were designed to better align with the specific needs of their educational systems.

In addition to the provision of the manual, in 51 of the cases, countries/territories offered other types of activities or materials to support co-ordinators in understanding their roles more effectively. These ranged from in-person or online training sessions and workshops (which were sometimes recorded) to instructional videos, dedicated training platforms, brochures or flyers. Furthermore, some national centres provided additional support through email, phone calls, WhatsApp/Telegram groups, or even a hotline that co-ordinators could use to address urgent matters during the survey administration period.

### 7.3.3. School/ECEC Setting Co-ordinator Manual reviews

As part of their second task, when visiting the NPM, IQOs were required to obtain copies of all translated/adapted School/ECEC Setting Co-ordinator Manual(s) used by the participating country/territory.

The School/ECEC Setting Co-ordinator Manuals explained in detail the procedures co-ordinators needed to follow for the selection of teachers/ECEC staff eligible for the survey, the activities occurring prior to and during the survey administration, and the flow of communication between NPMs and co-ordinators to monitor different administration activities. The ISC provided an international version of the manual that needed to be translated and adapted by national centres. The manuals contained sections that needed to be adapted. These required adaptations were shown between brackets and highlighted in yellow.

As part of their review, IQOs were asked to compare selected sections of the translated manuals against the international (English) source versions. When reporting the results of their review, IQOs indicated if the text in the national manuals was:

- Comparable to the international source: the translation remained equivalent or near identical to the international source.
- Not comparable to the international source: the translation deviated in content or meaning from the international source. For these cases, IQOs were asked to provide a rough English back translation.
- Adapted (required): when a paragraph contained a required adaptation, IQOs provided a rough English back translation of the national adaptation.
- Not included: if a sentence or paragraph may have been removed in the national co-ordinator's manual, IQOs were asked to indicate which section or sections were removed.

In most of the cases, manuals were adapted and translated for each administered component and each ISCED level. Although manuals across ISCED levels were similar, IQOs were requested to review and report on each of these (see Table 7.4 for more information). Countries/territories could also adapt and translate the manuals into all of the administered survey languages, in which cases, IQOs were also requested to review each of the translated versions of the manuals.

**Table 7.4. Manuals to be reviewed by the IQOs**

| Manual                                                                                  | TALIS core survey |         |         | TKS     | TALIS Starting Strong |    |
|-----------------------------------------------------------------------------------------|-------------------|---------|---------|---------|-----------------------|----|
|                                                                                         | ISCED 2           | ISCED 1 | ISCED 3 | ISCED 2 | ISCED 02              | U3 |
| School Co-ordinator Manual – main survey<br>TALIS core survey and optional ISCED levels | ✓                 | ✓       | ✓       |         |                       |    |
| School Co-ordinator Manual – main survey<br>TALIS core survey, TKS                      |                   |         |         | ✓       |                       |    |
| ECEC Setting Co-ordinator Manual – main survey<br>TALIS Starting Strong                 |                   |         |         |         | ✓                     | ✓  |



IQOs reviewed a total of 76 manuals for countries/territories administering the TALIS core survey, 8 manuals for countries/territories administering the TALIS core survey (ISCED level 2) together with the TKS and 26 manuals for countries/territories that administered TALIS Starting Strong. Above 80% of the reviewed manuals were translated into all languages administered within a country/territory, whereas close to 10% of manuals were only translated to one of the administered languages (Table 7.5).

**Table 7.5. Manuals to be reviewed**

| Was the manual translated into all of the administered languages?                       |         |        |
|-----------------------------------------------------------------------------------------|---------|--------|
|                                                                                         | Yes (%) | No (%) |
| School Co-ordinator Manual – main survey<br>TALIS core survey and optional ISCED levels | 92.1    | 7.9    |
| School Co-ordinator Manual – main survey<br>TALIS core survey, TKS                      | 100.0   | 0.0    |
| ECEC Setting Co-ordinator Manual – main survey<br>TALIS Starting Strong                 | 84.6    | 15.4   |

In addition, IQOs were asked to assess whether the format of the manuals deviated from the international source version. For both the TALIS core and TKS co-ordinator manuals, in approximately 25% of the cases, IQOs reported significant deviations in the manual's format compared to the international source version. In contrast, for the ECEC Setting Co-ordinator Manual, nearly half of the cases (Table 7.6) deviated in format, as also noted by some NPMs during the NPM interviews.

Examples of structural changes to the manuals primarily involved splitting the content into separate sections. For instance, some manuals included distinct sections focusing on procedures prior to data collection (such as teacher/staff selection) and sections dedicated to data collection processes. Other modifications included condensing and summarising the manual into smaller, more concise documents or relocating tables to appendices.

Following further review with IQOs (as detailed in the “Co-ordinator interviews outcomes” section), it was reported that regardless of the structural changes, co-ordinators understood their tasks and roles effectively. This suggests that the restructuring of the manuals did not negatively impact the co-ordinators' work.

**Table 7.6. Format of manuals**

| Did the format of the manual(s) strongly deviate from the international source version? |         |        |
|-----------------------------------------------------------------------------------------|---------|--------|
|                                                                                         | Yes (%) | No (%) |
| School Co-ordinator Manual – main survey<br>TALIS core survey and optional ISCED levels | 28.9    | 71.1   |
| School Co-ordinator Manual – main survey<br>TALIS core Survey, TKS                      | 25.0    | 75.0   |
| ECEC Setting Co-ordinator Manual – main survey<br>TALIS Starting Strong                 | 57.7    | 42.3   |

In general, any modifications to the content of the manuals reported by the IQOs were minor. Examples of deviations included instances where the cover letters (containing the link to the survey) were shared directly by the national centre instead of by the co-ordinators, when materials were only administered on paper (which was the case for only one of the countries/territories), when the national centre monitored the online participation of teachers/staff and it was not necessary for co-ordinators to complete the tracking form, or when the listing forms (TLF) were also prepared directly by the national centre.



### 7.3.4. Co-ordinator interviews outcomes

One of the most demanding tasks for the IQO was to conduct online interviews with the co-ordinators for a selected number of centres.

Together with the NPM, the IQO needed to select 20 ECEC settings for TALIS Starting Strong and/or 20 schools for the TALIS core survey/TKS (depending on the components administered within the country/territory) and conduct online interviews with the school/ECEC setting co-ordinators of the randomly selected centres. The completion of this responsibility included:

- interviewing the school/ECEC setting co-ordinator about TALIS 2024 activities prior to and during survey administration
- where applicable, splitting the interviews across the participating ISCED levels for each component
- recording interview responses on the online Co-ordinator Interview Record.

The co-ordinator interview covered a range of topics, including the co-ordinator's background information, the initial preparations undertaken before survey administration, and challenges related to understanding and using the listing and tracking forms and manual. The interview also addressed survey administration activities, such as communication with the NPM, potential issues encountered during the survey process and the co-ordinator's overall impressions of the survey's administration. Additionally, IQOs were asked to share their impressions of the co-ordinator's performance and evaluate their preparedness for the role.

#### *School/ECEC setting selection design*

Upon meeting with the NPM, IQOs were asked to make a random selection (after detailed IEA guidelines were provided) of a subset of schools/ECEC settings. Prior to that random selection, the IQOs needed to disregard educational centres already selected for national quality observations (to avoid overburdening a school/ECEC setting).

Thanks to the mode of the interview (online), IQOs had no geographical constraints to consider when selecting centres. Although the total number of schools and/or ECEC settings to be selected was 20, IQOs were required to include at least 2 additional educational centres (per ISCED level) as potential replacements. For countries/territories administering the survey across more than 1 ISCED level, IQOs were instructed to ensure an even selection of the 20 schools/settings per level (as shown in Table 7.7). Similarly, for countries/territories administering the survey in multiple languages, IQOs were asked to account for this in their selection process.

Once the NPM shared the list of participating schools/ECEC settings and once the schools/ECEC settings selected for national quality observations were removed, the IQO randomly selected schools/ECEC settings from the remaining list of schools/ECEC settings. Samples of schools/ECEC settings submitted to the IEA were anonymised, with the names and addresses of the schools/settings omitted from the list.

Upon review and approval of the school's/ECEC setting's selection by IEA Amsterdam, the IQOs approached the school/ECEC setting co-ordinators to introduce themselves and set up the online interview. IQOs could make use of different platforms for the online interviews but were required to ensure that the platform was compliant with the data protection regulations of TALIS 2024, their country/territory, as well as to provide any relevant information about this to the individuals being interviewed.

**Table 7.7. Number of schools and ECEC settings selected for interview per component and ISCED level**

| Country/territory                | TALIS core survey (schools) |         |         | TALIS Starting Strong (ECEC settings) |    |
|----------------------------------|-----------------------------|---------|---------|---------------------------------------|----|
|                                  | ISCED 2                     | ISCED 1 | ISCED 3 | ISCED 02                              | U3 |
| Albania                          | 20                          |         |         |                                       |    |
| Alberta (Canada)                 | 20                          |         |         |                                       |    |
| Australia                        | 10                          | 10      |         |                                       |    |
| Austria                          | 20                          |         |         |                                       |    |
| Azerbaijan                       | 20                          |         |         |                                       |    |
| Bahrain                          | 20                          |         |         |                                       |    |
| Brazil                           | 10                          | 10      |         |                                       |    |
| Bulgaria                         | 20                          |         |         |                                       |    |
| Chile*                           | 20                          |         |         | 20                                    |    |
| Colombia †                       | 20                          |         |         | 20                                    |    |
| Costa Rica                       | 20                          |         |         |                                       |    |
| Croatia*                         | 10                          |         | 10      |                                       |    |
| Cyprus                           | 20                          |         |         |                                       |    |
| Czechia                          | 20                          |         |         |                                       |    |
| Denmark                          | 10                          |         | 10      | 20                                    |    |
| Estonia                          | 20                          |         |         |                                       |    |
| Finland                          | 20                          |         |         | 20                                    |    |
| Flemish Community (Belgium)      | 7                           | 7       | 6       | 10                                    | 10 |
| France                           | 10                          | 10      |         |                                       |    |
| French Community (Belgium)       | 10                          | 10      |         |                                       |    |
| Germany                          |                             |         |         | 10                                    | 10 |
| Hungary                          | 20                          |         |         |                                       |    |
| Iceland †                        | 19                          |         |         |                                       |    |
| Ireland                          |                             |         |         | 10                                    | 10 |
| Israel †                         | 20                          |         |         | 10                                    | 10 |
| Italy                            | 20                          |         |         |                                       |    |
| Japan †                          | 10                          | 10      |         | 20                                    |    |
| Kazakhstan                       | 20                          |         |         |                                       |    |
| Korea                            | 10                          | 10      |         |                                       |    |
| Kosovo                           | 20                          |         |         |                                       |    |
| Latvia                           | 20                          |         |         |                                       |    |
| Lithuania                        | 20                          |         |         |                                       |    |
| Malta                            | 20                          |         |         |                                       |    |
| Montenegro                       | 20                          |         |         |                                       |    |
| Morocco*                         | 10                          | 10      |         | 20                                    |    |
| Netherlands                      | 10                          | 10      |         |                                       |    |
| New Brunswick, Quebec (Canada) † |                             |         |         |                                       | 20 |
| New Zealand                      | 10                          | 10      |         | 10                                    | 10 |
| North Macedonia                  | 20                          |         |         |                                       |    |

| Country/territory    | TALIS core survey (schools) |         |         | TALIS Starting Strong (ECEC settings) |    |
|----------------------|-----------------------------|---------|---------|---------------------------------------|----|
|                      | ISCED 2                     | ISCED 1 | ISCED 3 | ISCED 02                              | U3 |
| Norway               | 20                          |         |         | 10                                    | 10 |
| Poland*              | 20                          |         |         |                                       |    |
| Portugal*            | 10                          |         | 10      |                                       |    |
| Romania              | 20                          |         |         |                                       |    |
| Saudi Arabia*        | 7                           | 7       | 6       |                                       |    |
| Serbia               | 20                          |         |         |                                       |    |
| Shanghai (China)     | 20                          |         |         |                                       |    |
| Singapore            | 20                          |         |         |                                       |    |
| Slovak Republic      | 20                          |         |         |                                       |    |
| Slovenia †           | 14                          |         | 6       |                                       |    |
| South Africa*        | 20                          |         |         |                                       |    |
| Spain                | 10                          | 10      |         | 20                                    |    |
| Sweden †             | 20                          |         |         | 20                                    |    |
| Türkiye              | 7                           | 7       | 6       | 20                                    |    |
| United Arab Emirates | 7                           | 7       | 6       |                                       |    |
| United States*       | 20                          |         |         |                                       |    |
| Uzbekistan           | 20                          |         |         |                                       |    |
| Viet Nam             | 20                          |         |         |                                       |    |
| Total                | 891                         | 128     | 60      | 240                                   | 80 |

Notes: Countries/territories \* with an asterisk refer to those that also participated in the TKS.

Colombia †: Due to the survey's large administration window (lasting from March until August), two IQOs were used for the quality control programme.

Iceland †: The planned number of schools was 20 but, due to time constraints, only 19 interviews with co-ordinators could take place.

Israel †: Due to the languages in which the survey was administered, two IQOs were used for the quality control programme.

Japan †: Due to the survey's large administration window (lasting from February until August), two IQOs were used for the quality control programme.

New Brunswick, Quebec (Canada) †: Ten settings were selected from the New Brunswick region (English speaking) and ten from Quebec region (French speaking).

Slovenia †: Due to the structure of the educational system, 14 centres at ISCED levels 1 and 2 were selected.

Sweden †: Due to the structure of the educational system, 20 ECEC settings were divided in 15 care centres and 5 early childhood centres.

### *Background information and initial preparations*

The first section of the interview focused on the initial preparation for conducting the survey, which included co-ordinators' participation in training, impressions about the manuals, familiarising themselves with the procedures, and receiving and checking the required materials prior to the beginning of the administration.

In nearly 35% of the cases, school co-ordinators had prior experience in their role, having participated in TALIS or similar studies. By contrast, only 10% of ECEC setting co-ordinators reported having such experience.

A key resource for co-ordinators was the manual provided by national centres. Over 90% of both school and ECEC setting co-ordinators (see Table 7.8) found the manual helpful in understanding their role. However, in 10-15% of cases, co-ordinators suggested that improvements were needed to enhance its clarity or usability.

**Table 7.8. Co-ordinators' initial preparation responses**

|                                                                                                                                                                                                        | Yes (%) | No (%) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|
| <b>Have you previously acted as a co-ordinator for any other survey and/or assessment?</b>                                                                                                             |         |        |
| School co-ordinators                                                                                                                                                                                   | 34.5    | 65.5   |
| ECEC setting co-ordinators                                                                                                                                                                             | 10.0    | 90.0   |
| <b>Overall, do you feel the TALIS 2024 co-ordinator manual helped you to understand your role?</b>                                                                                                     |         |        |
| School co-ordinators                                                                                                                                                                                   | 97.7    | 2.3    |
| ECEC setting co-ordinators                                                                                                                                                                             | 91.5    | 8.5    |
| <b>Do you feel the TALIS 2024 co-ordinator manual could be improved in any manner?</b>                                                                                                                 |         |        |
| School co-ordinators                                                                                                                                                                                   | 10.5    | 89.5   |
| ECEC setting co-ordinators                                                                                                                                                                             | 14.7    | 85.3   |
| <b>In addition to the TALIS 2024 co-ordinator manual, were there any other types of activities or materials provided that helped you to better understand your position before the administration?</b> |         |        |
| School co-ordinators                                                                                                                                                                                   | 67.0    | 33.0   |
| ECEC setting co-ordinators                                                                                                                                                                             | 45.9    | 54.1   |

Note: One thousand and seventy-nine school co-ordinators were interviewed for countries/territories that administered the TALIS core survey; 320 ECEC setting co-ordinators were interviewed for countries/territories that administered TALIS Starting Strong.

Beyond the manual, national centres also informed about additional activities or provided additional materials to support co-ordinators. These included training sessions (conducted either in person or online), videos, presentations, brochures and support via phone, video calls or other communication platforms. However, there was a notable difference in the reported availability of these resources: while 67% of school co-ordinators indicated that they received additional support, only 46% of ECEC setting co-ordinators reported the same. IQO information matches the information provided by NPMs during the interview as reflected in the section “NPM visit and interview outcomes”.

Regarding the receipt of required materials for administering the survey (see Table 7.9), close to 100% of school and ECEC setting co-ordinators reported receiving the TLFs, while the receipt of tracking forms (TTF) came to approximately 85% for both types of settings. IQOs and NPMs confirmed that, in some cases, the selection of teachers from schools/settings was handled by the national centres, as they had access to an updated census of teachers. Consequently, it was not necessary for IQOs to complete this task. Similarly, for TTFs, many national centres monitored survey completion directly, which reduced the need for co-ordinators to fill out the TTFs themselves.

**Table 7.9. Correct receipt of needed items**

|                                               | Yes (%) | No (%) | Not applicable (%) |
|-----------------------------------------------|---------|--------|--------------------|
| <b>Listing form</b>                           |         |        |                    |
| School co-ordinators                          | 96.8    | 1.8    | 1.5                |
| ECEC setting co-ordinators                    | 97.2    | 2.2    | 0.6                |
| <b>Tracking form</b>                          |         |        |                    |
| School co-ordinators                          | 86.9    | 5.3    | 7.8                |
| ECEC setting co-ordinators                    | 80.9    | 5.3    | 13.8               |
| <b>Cover letters (online data collection)</b> |         |        |                    |
| School co-ordinators                          | 93.2    | 1.7    | 5.1                |
| ECEC setting co-ordinators                    | 96.9    | 1.3    | 1.9                |

|                                             | Yes (%) | No (%) | Not applicable (%) |
|---------------------------------------------|---------|--------|--------------------|
| <b>Data protection notice</b>               |         |        |                    |
| School co-ordinators                        | 88.6    | 3.2    | 8.2                |
| ECEC setting co-ordinators                  | 88.1    | 2.8    | 9.1                |
| <b>Paper questionnaires (if applicable)</b> |         |        |                    |
| School co-ordinators                        | 9.9     | 2.2    | 87.8               |
| ECEC setting co-ordinators                  | 31.6    | 0.6    | 67.8               |

Note: One thousand and seventy-nine school co-ordinators were interviewed for countries/territories that administered the TALIS core survey; 320 ECEC setting co-ordinators were interviewed for countries/territories that administered TALIS Starting Strong.

In terms of cover letters, more than 90% of co-ordinators reported receiving them from the NPM, which aligns with cases where survey administration was conducted on line. The proportion of co-ordinators who received paper questionnaires was higher in ECEC settings compared to schools (31.6% versus 9.9%), suggesting that while paper-based administration was relatively uncommon overall, it was more frequently used in early years settings.

Co-ordinators were also asked about their communication with the NPMs (see Table 7.10) regarding their role, the receipt of materials and any potential delays in survey administration. For both ECEC setting and school co-ordinators, communication was reported to work well in more than 90% of cases, although slightly lower percentages were observed for ECEC settings compared to schools.

**Table 7.10. Communication with NPMs**

|                                                                                               | Worked well (%) | Needs improvements (%) |
|-----------------------------------------------------------------------------------------------|-----------------|------------------------|
| <b>Communication about the co-ordinator role itself</b>                                       |                 |                        |
| School co-ordinators                                                                          | 97.9            | 2.1                    |
| ECEC setting co-ordinators                                                                    | 92.2            | 7.8                    |
| <b>Communication about when the materials will be received</b>                                |                 |                        |
| School co-ordinators                                                                          | 96.4            | 3.6                    |
| ECEC setting co-ordinators                                                                    | 91.3            | 8.8                    |
| <b>Communication about delays or changes in the administration for your country/territory</b> |                 |                        |
| School co-ordinators                                                                          | 96.5            | 3.5                    |
| ECEC setting co-ordinators                                                                    | 91.6            | 8.4                    |

Note: One thousand and seventy-nine school co-ordinators were interviewed for countries/territories that administered the TALIS core survey; 320 ECEC setting co-ordinators were interviewed for countries/territories that administered TALIS Starting Strong.

Lastly, and in relation to the co-ordinators' understanding of the TLF (see Table 7.11), these reported minimal difficulties, with over 90% indicating that they understood and were able to use it effectively.

**Table 7.11. Co-ordinators' difficulties understanding the listing form**

|                                                                                             | Yes (%) | No (%) |
|---------------------------------------------------------------------------------------------|---------|--------|
| <b>Difficulties understanding which teachers/staff should be listed in the listing form</b> |         |        |
| School co-ordinators                                                                        | 4.5     | 95.5   |
| ECEC setting co-ordinators                                                                  | 7.2     | 92.8   |

|                                                                                                 | Yes (%) | No (%) |
|-------------------------------------------------------------------------------------------------|---------|--------|
| <b>Difficulties understanding which teachers/staff should not be listed in the listing form</b> |         |        |
| School co-ordinators                                                                            | 2.5     | 97.5   |
| ECEC setting co-ordinators                                                                      | 3.4     | 96.6   |
| <b>Difficulties completing the listing form</b>                                                 |         |        |
| School co-ordinators                                                                            | 2.9     | 97.1   |
| ECEC setting co-ordinators                                                                      | 4.1     | 95.9   |
| <b>Difficulties returning the listing form</b>                                                  |         |        |
| School co-ordinators                                                                            | 1.0     | 99.0   |
| ECEC setting co-ordinators                                                                      | 4.1     | 95.9   |

Note: One thousand and seventy-nine school co-ordinators were interviewed for countries/territories that administered the TALIS core survey; 320 ECEC setting co-ordinators were interviewed for countries/territories that administered TALIS Starting Strong.

### *Survey administration activities*

The second section of the interview focused on how co-ordinators administered the survey, emphasising aspects related to the selection of the survey population and potential difficulties that may have arisen during the process.

In this section, IQOs were asked to review the TLFs with co-ordinators to confirm whether the selection adhered to the sampling guidelines. As shown in Table 7.12, in 96% of cases, co-ordinators reported that the teachers or staff listed on the form constituted a complete representation of the surveyed population, both for schools and ECEC settings.

**Table 7.12. Teachers/staff sampled for the survey**

|                                                                                                                               | Yes (%) | No (%) |
|-------------------------------------------------------------------------------------------------------------------------------|---------|--------|
| <b>Is this a complete list of all teachers/staff employed at this school, teaching the surveyed population(s)?</b>            |         |        |
| School co-ordinators                                                                                                          | 96.4    | 3.6    |
| ECEC setting co-ordinators                                                                                                    | 96.6    | 3.4    |
| <b>Is there anyone listed on the listing form who is NOT a member of staff/leader/teacher?</b>                                |         |        |
| School co-ordinators                                                                                                          | 4.5     | 95.5   |
| ECEC setting co-ordinators                                                                                                    | 1.6     | 98.4   |
| <b>Do you think you will experience any issues completing the tracking form before it is returned to the national centre?</b> |         |        |
| School co-ordinators                                                                                                          | 3.7     | 96.3   |
| ECEC setting co-ordinators                                                                                                    | 3.4     | 96.6   |

Note: One thousand and seventy-nine school co-ordinators were interviewed for countries/territories that administered the TALIS core survey; 320 ECEC setting co-ordinators were interviewed for countries/territories that administered TALIS Starting Strong.

However, co-ordinators also noted that in 4.5% of cases for schools and 1.6% of cases for ECEC settings, individuals listed on the form fell outside the scope of TALIS. For schools, this included: substitute, emergency or occasional teachers; teachers exclusively teaching adults; teachers on long-term leave; teacher aides; pedagogical support staff; and health and social support staff. For ECEC settings, out-of-scope staff included nannies, volunteers, auxiliary staff, medical and therapeutic staff, occasional or emergency staff and staff on long-term leave.

The most common issues, particularly for schools, related to principal names being included in TLF or having listed teachers on long-term leave. Other challenges arose from staff changes occurring after the selection process, such as teachers leaving their positions. After further review and discussions with NPMs, it was confirmed that these issues were resolved during the weighting phase or addressed by identifying discrepancies in the TTF.

Co-ordinators were also asked if they encountered or anticipated any challenges in completing the TTF, a document that was used to record discrepancies between the teachers/staff listed on the form and the current situation in the school or ECEC setting, as well as to track the return status of questionnaires. Over 96% of co-ordinators from both schools and ECEC settings reported no difficulties or expected issues with completing the form.

Regarding the distribution of cover letters or paper questionnaires (where applicable), 86.5% of school co-ordinators and 79.9% of ECEC setting co-ordinators indicated that they provided these materials directly to teachers or staff. In the remaining cases, letters were sent to participants electronically by the national centre. Other methods included distribution by an assistant to the co-ordinator, handing them out during meetings or leaving them in teachers'/staff's mailboxes or pigeonholes.

To better understand the administration of the TALIS survey, co-ordinators were asked if they were approached by participants with questions or concerns about this process (Table 7.13). Overall, less than 15% of co-ordinators reported being contacted by respondents about survey-related issues. The most common queries pertained to the purpose of the survey (raised in 11.4% of cases for school co-ordinators), general clarifications about the survey (between 12% and 13.5% for school and ECEC setting co-ordinators), the confidentiality of responses (particularly for school co-ordinators, in 7.6% of cases) and difficulties with specific survey questions (reported by 6.6% of school co-ordinators and 10% of ECEC setting co-ordinators).

**Table 7.13. Co-ordinator reports of questions/concerns from TALIS respondents**

|                                            | Yes (%) | No (%) |
|--------------------------------------------|---------|--------|
| <b>Purpose of the survey</b>               |         |        |
| School co-ordinators                       | 11.4    | 88.6   |
| ECEC setting co-ordinators                 | 5.6     | 94.4   |
| <b>Questionnaire return procedures</b>     |         |        |
| School co-ordinators                       | 4.5     | 95.5   |
| ECEC setting co-ordinators                 | 3.4     | 96.6   |
| <b>Clarification of any kind</b>           |         |        |
| School co-ordinators                       | 12.7    | 87.3   |
| ECEC setting co-ordinators                 | 13.1    | 86.9   |
| <b>An error they spotted</b>               |         |        |
| School co-ordinators                       | 3.3     | 96.7   |
| ECEC setting co-ordinators                 | 1.3     | 98.8   |
| <b>Confidentiality of survey responses</b> |         |        |
| School co-ordinators                       | 7.6     | 92.4   |
| ECEC setting co-ordinators                 | 1.9     | 98.1   |
| <b>Any questions they could not answer</b> |         |        |
| School co-ordinators                       | 6.6     | 93.4   |
| ECEC setting co-ordinators                 | 10.0    | 90.0   |

Note: One thousand and seventy-nine school co-ordinators were interviewed for countries/territories that administered the TALIS core survey; 320 ECEC setting co-ordinators were interviewed for countries/territories that administered TALIS Starting Strong.



The IQO programme also investigated potential issues experienced by participants while completing the online questionnaire. Approximately 20% of school and ECEC setting co-ordinators reported that participants encountered challenges such as accessing the platform, login issues, Internet connectivity problems or a lack of familiarity with online surveys.

Lastly, co-ordinators were asked if they planned to implement specific actions to encourage participation, such as discussions with teachers or staff, providing food or small gifts, or sending reminders. Among school co-ordinators, 47.8% confirmed plans to implement such actions, compared to 28.4% of ECEC setting co-ordinators. Examples of these actions included organising staff meetings to promote participation, distributing TALIS informational materials, allowing teachers/staff to complete the questionnaire during working hours and adjusting schedules accordingly, engaging in informal conversations about the survey's importance and sending email reminders to participants.

### *Co-ordinators' and IQOs' general feedback*

To close the interview, IQOs asked co-ordinators for their general impressions of the survey administration. IQOs were also invited to provide their own assessments of the co-ordinators' work and how well they were prepared for the survey's administration.

When co-ordinators were asked about the level of co-operation among survey participants in TALIS, most participants were reported as extremely co-operative (approximately 49%) or moderately co-operative (approximately 44%) for both school and ECEC setting co-ordinators. A similar pattern emerged when co-ordinators were asked about the attitudes of other school/ECEC staff towards the TALIS survey. For school co-ordinators, staff attitudes were primarily positive (48.6%) or neutral (41.0%), while for ECEC setting co-ordinators, the proportion of positive attitudes was slightly higher (58.0%) compared to neutral attitudes (36.7%). Only 7.2% of school co-ordinators and 3.1% of ECEC setting co-ordinators reported instances of refusal among participants.

**Table 7.14. Co-ordinators' report of TALIS respondents' co-operation**

|                                                                                                         | Extremely co-operative (%) | Moderately co-operative (%) | Somewhat co-operative (%) | Not very co-operative (%) |
|---------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------|---------------------------|---------------------------|
| <b>To what extent would you describe the participants as co-operative in their TALIS participation?</b> |                            |                             |                           |                           |
| School co-ordinators                                                                                    | 49.2                       | 44.2                        | 6.3                       | 0.3                       |
| ECEC setting co-ordinators                                                                              | 48.9                       | 45.1                        | 4.1                       | 1.9                       |
|                                                                                                         | Positive (%)               | Neutral (%)                 | Negative (%)              | Unknown (%)               |
| <b>Overall, how would you rate the attitude of other school/staff members towards the TALIS survey?</b> |                            |                             |                           |                           |
| School co-ordinators                                                                                    | 48.6                       | 41.0                        | 1.5                       | 8.9                       |
| ECEC setting co-ordinators                                                                              | 58.0                       | 36.7                        | 1.6                       | 3.8                       |

Note: One thousand and seventy-nine school co-ordinators were interviewed for countries/territories that administered the TALIS core survey; 320 ECEC setting co-ordinators were interviewed for countries/territories that administered TALIS Starting Strong.

Regarding co-ordinators' satisfaction with the administration of the TALIS survey within their centres, 97.9% of school co-ordinators and 91.3% of ECEC setting co-ordinators expressed high satisfaction.

IQOs' assessments of the co-ordinators' preparedness largely aligned with the co-ordinators' own impressions. IQOs reported that co-ordinators were very well prepared in 84% of schools and 74% of ECEC settings. This was followed by 14% to 24% of co-ordinators being rated as somewhat prepared in schools and ECEC settings respectively.

More than 89% of co-ordinators across both schools and ECEC settings were described as very willing to answer IQOs' questions (Table 7.15). Less than 1% of both school and ECEC setting co-ordinators were described as a little or very unwilling to answer questions.

**Table 7.15. IQOs' perceptions**

|                                                                                                                        | Very prepared (%)  | Somewhat prepared (%) | Somewhat unprepared (%) | Very unprepared (%) |
|------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------|-------------------------|---------------------|
| <b>In your opinion, how well prepared was the co-ordinator for administering the TALIS survey?</b>                     |                    |                       |                         |                     |
| School co-ordinators                                                                                                   | 84.0               | 14.4                  | 1.5                     | 0.2                 |
| ECEC setting co-ordinators                                                                                             | 74.1               | 23.8                  | 1.6                     | 0.6                 |
|                                                                                                                        | Very willing (%)   | A little willing (%)  | A little unwilling (%)  | Very unwilling (%)  |
| <b>How willing was the co-ordinator to answer your questions about survey administration activities?</b>               |                    |                       |                         |                     |
| School co-ordinators                                                                                                   | 92.2               | 6.9                   | 0.9                     | 0.0                 |
| ECEC setting co-ordinators                                                                                             | 89.4               | 9.7                   | 0.6                     | 0.3                 |
|                                                                                                                        | Definitely yes (%) | Probably yes (%)      | Probably not (%)        | Definitely not (%)  |
| <b>In your opinion, did the co-ordinator implement the TALIS procedures according to the international guidelines?</b> |                    |                       |                         |                     |
| School co-ordinators                                                                                                   | 83.4               | 14.9                  | 1.5                     | 0.2                 |
| ECEC setting co-ordinators                                                                                             | 73.8               | 24.7                  | 1.3                     | 0.3                 |

Note: One thousand and seventy-nine school co-ordinators were interviewed for countries/territories that administered the TALIS core survey; 320 ECEC setting co-ordinators were interviewed for countries/territories that administered TALIS Starting Strong.

Similar positive results appeared for the IQOs perceptions about the implementation of the TALIS procedures in line with the international guidelines, where in more than 73.8% of the cases IQOs agreed to have co-ordinators implement administrative processes in line with international procedures ("definitely yes").

### *Teacher Knowledge Survey general feedback*

With the first-time administration of the TKS, IQOs also asked co-ordinators about their perceptions of this component both from teachers' and co-ordinators' perspective. Responses show that 56.7% of co-ordinators indicated that teachers' attitudes seemed to be positive and 66.3% of co-ordinators also indicated a positive view of the survey.

**Table 7.16. TKS survey perceptions**

|                                                                | Positive (%) | Neutral (%) | Negative (%) |
|----------------------------------------------------------------|--------------|-------------|--------------|
| <b>What are, so far, teachers' perceptions of the TKS?</b>     | 56.7         | 42.3        | 1.0          |
| <b>What is your perception, as a co-ordinator, of the TKS?</b> | 66.3         | 33.7        | x            |

Note: Ninety-eight school co-ordinators were interviewed for countries/territories that administered the TALIS core survey.  
x: Not applicable.

## 7.4. Extra quality control questions

Following from the OECD TALIS 2018 cycle, additional innovative quality control questions were administered to respondents at the end of the questionnaires during the TALIS field trial and main survey. The quality control questions were intended to: i) allow the ISC to elicit relevant information directly from online respondents; and ii) help inform the adjudication process and decision making for TALIS 2024.

For the field trial, a total of 12 questions were administered to all respondents based on a rotated design. Questions were translated and adapted by countries/territories during the regular instrument preparation process (see Chapter 4). Respondents were randomly assigned one group of questions for a maximum of three questions per respondent. Questions were administered only after the regular survey was complete and an introductory message was provided indicating that responses were voluntary. Overall, response rates were high, ranging from a low of 70% to a high of 100%, indicating a willingness of respondents to provide information.

Following the field trial data collection, responses to the quality control questions were analysed by component and country/territory to look for potential areas of improvement prior to the main survey. In addition, the questions themselves were evaluated to ensure they provided clear and meaningful information.

There was consensus that the quality control questions did not overburden respondents and provided valuable data for the TALIS field trial. However, it was decided that full application of all questions for the main survey would be repetitive given that national and international quality observations would already collect some of this information. In addition, due to the applicability of some questions, several were dropped and others underwent minor revisions. Consequently, two question groups were included for the main survey, each with three questions. One of the two question groups was randomly assigned to 10% of respondents for each component such that 20% of the respondents overall (for each component) responded to a set of questions.

Across each component, a similar number of respondents answered each question. The approximate number of respondents across questions for each component was:

- ISCED level 1: 5 500 respondents
- ISCED level 2: 18 000 respondents
- ISCED level 3: 2 700 respondents
- TKS: 1 700 respondents
- TALIS Starting Strong: 1 800 respondents.

Overall, respondents reported that they were selected to participate in TALIS in a way that was consistent with the TALIS Technical Standards (Table 7.17). It was more common for all teachers/staff in a school/ECEC setting to be selected to participate at lower ISCED levels, which is in line with the fact that schools/ECEC setting generally increase in size as the ISCED level increases.

For most components, the majority of respondents (Table 7.18) were provided sufficient time to complete the survey. For the TKS, a higher percentage reported that they were only provided one day or less. This is consistent with the fact that the survey was only open for a 24-hour window once it was started. It is possible that some TKS respondents confused the full amount of time they had to complete the TKS with the time window they had to complete the survey once started. Therefore, modifications to this question could be considered for future TALIS cycles if this question were included.

Table 7.17. Respondent reports of selection for TALIS

|                                                                                    | ISCED<br>1 (%) | ISCED<br>2 (%) | ISCED<br>3 (%) | TKS<br>(%) | TALIS<br>Starting<br>Strong (%) |
|------------------------------------------------------------------------------------|----------------|----------------|----------------|------------|---------------------------------|
| <b>How were you selected to participate in OECD [TALIS/TALIS Starting Strong]?</b> |                |                |                |            |                                 |
| Every teacher/staff in this school/ECEC setting was selected to participate        | 46.5           | 30.6           | 16.7           | 31.5       | 40.1                            |
| I was informed that I was randomly selected to participate                         | 41.1           | 57.1           | 64.9           | 52.3       | 47.3                            |
| I was asked to participate to replace a colleague who did not participate          | 0.2            | 0.3            | 0.3            | 0.6        | 0.4                             |
| I requested to participate myself                                                  | 1.0            | 1.0            | 0.8            | 1.7        | 1.1                             |
| I do not know                                                                      | 11.3           | 11.1           | 17.4           | 14.0       | 11.0                            |

Table 7.18. Respondent reports of time allotted for survey completion

|                                                                | ISCED<br>1 (%) | ISCED<br>2 (%) | ISCED<br>3 (%) | TKS<br>(%) | TALIS<br>Starting<br>Strong (%) |
|----------------------------------------------------------------|----------------|----------------|----------------|------------|---------------------------------|
| <b>How much time were you provided to complete the survey?</b> |                |                |                |            |                                 |
| One day or less                                                | 23.9           | 30.2           | 17.9           | 48.7       | 25.4                            |
| More than one day but less than one week                       | 20.8           | 16.0           | 16.5           | 12.1       | 24.2                            |
| Between one and two weeks                                      | 17.4           | 15.2           | 18.3           | 12.3       | 14.9                            |
| More than two weeks                                            | 28.1           | 29.3           | 38.3           | 21.8       | 19.5                            |
| I do not know                                                  | 9.8            | 9.4            | 8.9            | 5.1        | 16.0                            |

Security of login details is important to ensure that each individual is only able to access their own survey. Overall, respondents indicated (Table 7.19) that this information was provided in a secure manner. However, some respondents were provided their login details in ways that may have been visible to other teachers/staff in their educational centres.

Table 7.19. Respondent reports of security of login details

|                                                                                           | ISCED<br>1 (%) | ISCED<br>2 (%) | ISCED<br>3 (%) | TKS<br>(%) | TALIS<br>Starting<br>Strong (%) |
|-------------------------------------------------------------------------------------------|----------------|----------------|----------------|------------|---------------------------------|
| <b>How were your personal login details provided to you?</b>                              |                |                |                |            |                                 |
| In a secure manner (e.g. in a personal email, in a sealed envelope)                       | 85.1           | 83.5           | 79.1           | 83.3       | 84.3                            |
| In a group email with information for other users visible                                 | 2.2            | 2.6            | 1.6            | 1.4        | 3.1                             |
| In a newsletter or posting visible to all teachers/staff in the school/ECEC setting       | 2.8            | 2.5            | 2.1            | 5.5        | 3.1                             |
| In direct communication to me, but not securely sealed (e.g. school/ECEC setting mailbox) | 5.0            | 6.4            | 9.5            | 4.9        | 3.6                             |
| In some other way                                                                         | 4.8            | 5.1            | 7.7            | 4.9        | 5.9                             |

In order to respond truthfully to the survey, it is important that respondents are aware that their responses are kept confidential. Less than 10% of respondents across components (Table 7.20) indicated that they were not at all confident their responses to the survey would be kept confidential, indicating overall confidence in the confidentiality of the TALIS data.

**Table 7.20. Respondent reports of confidence in confidentiality**

|                                                                                                                 | ISCED 1<br>(%) | ISCED 2<br>(%) | ISCED 3<br>(%) | TKS<br>(%) | TALIS<br>Starting<br>Strong (%) |
|-----------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|------------|---------------------------------|
| <b>How confident are you that your responses to<br/>OECD [TALIS/Starting Strong] will be kept confidential?</b> |                |                |                |            |                                 |
| Not at all                                                                                                      | 8.3            | 9.8            | 9.4            | 9.0        | 7.0                             |
| To some extent                                                                                                  | 29.6           | 28.2           | 23.0           | 18.4       | 27.5                            |
| Quite a bit                                                                                                     | 30.9           | 31.6           | 29.0           | 32.8       | 32.3                            |
| A lot                                                                                                           | 31.2           | 30.4           | 38.6           | 39.8       | 33.1                            |

Overall, reports of problems encountered while completing the survey were small, although lack of time to complete the survey was selected as the most common issue (Table 7.21).

**Table 7.21. Respondent reports of problems encountered**

|                                                                    | ISCED 1<br>(%) | ISCED 2<br>(%) | ISCED 3<br>(%) | TKS<br>(%) | TALIS<br>Starting<br>Strong (%) |
|--------------------------------------------------------------------|----------------|----------------|----------------|------------|---------------------------------|
| <b>Did you encounter any problems while completing the survey?</b> |                |                |                |            |                                 |
| Login issues                                                       | 7.5            | 7.9            | 7.0            | 11.7       | 7.7                             |
| Response saving                                                    | 9.5            | 10.6           | 10.3           | 9.1        | 6.7                             |
| Navigation issues                                                  | 5.7            | 5.8            | 4.9            | 6.8        | 5.1                             |
| Internet failure                                                   | 7.2            | 7.7            | 5.8            | 13.1       | 4.9                             |
| Computer failure (e.g. power loss)                                 | 3.3            | 3.6            | 2.7            | 6.1        | 2.5                             |
| Lack of time                                                       | 35.7           | 30.0           | 30.2           | 32.5       | 35.8                            |

Lack of time to devote to the survey was the most common issue reported by respondents. Interestingly, a lower percentage of respondents felt that TALIS was not a good use of their time. In addition, close to 50% of the respondents indicated that it was interesting, and less than 21% of the respondents reported the survey was difficult (Table 7.22). It is not surprising that a higher share of teachers reported the TKS as “difficult” compared to other ISCED level 2 respondents, given the inclusion of an assessment component.

Responses to the extra quality control questions were examined across countries/territories. Overall, the results indicated that particular responses were not clustered within countries/territories. If response clusters were identified that indicated a potential issue within a country/territory, these were discussed during data adjudication. During these discussions, it was determined that no identified issues within countries/territories warranted further investigation.

Overall, the extra quality control questions provided additional information on the quality of the TALIS implementation directly from respondents. The willingness of respondents to answer these questions indicates that they were receptive to providing this information and inclusion of the questions should be considered for future rounds. Most of the questions functioned well, but some (such as the time provided to respond to the survey, in the very specific case of the TKS) could have been unclear and should be modified for future cycles, if included. Country/territory level analysis was also helpful in pointing to potential issues that could be further investigated to ensure the highest quality data possible.

Table 7.22. Respondent reports of overall experience

|                                                                                                               | ISCED 1<br>(%) | ISCED 2<br>(%) | ISCED 3<br>(%) | TKS<br>(%) | TALIS<br>Starting<br>Strong (%) |
|---------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|------------|---------------------------------|
| <b>Which statements describe your overall experience participating in OECD [TALIS/TALIS Starting Strong]?</b> |                |                |                |            |                                 |
| It was straightforward                                                                                        | 34.4           | 33.5           | 34.0           | 18.6       | 32.3                            |
| It was interesting                                                                                            | 39.4           | 45.1           | 48.8           | 52.4       | 45.9                            |
| It was difficult                                                                                              | 18.8           | 13.4           | 11.1           | 21.2       | 21.2                            |
| It was not a good use of my time                                                                              | 20.4           | 19.4           | 17.3           | 15.9       | 13.3                            |

## 7.5. The survey activities questionnaire

The SAQ covered all aspects of survey administration. The ISC prepared this online questionnaire using the SoSci Survey software platform (<http://www.soscisurvey.de>) and delivered it to NPMs on 4 March 2024. The questionnaire, consisting of 10 content sections and 71 questions, asked the national centres to provide information about all survey-related activities and the extent to which procedures and guidelines had been followed. The questionnaire also gave NPMs an opportunity to provide valuable feedback on all aspects of survey administration, including survey procedures and manuals, guidelines, support materials and software. All participating countries/territories completed the questionnaire between March 2024 and January 2025. The following subsections present the results of this survey.

### 7.5.1. Within-school/ECEC setting sampling

The national centres in all countries/territories used the IEA Windows Within-School Sampling Software (WinW3S) provided by the ISC. Eight national centres used prepopulated teacher listing forms. The national centres included information from ministries or school authorities in the lists before they sent them to schools, which meant that the school co-ordinators (SCs) only had to update the information. Seventeen national centres used methods other than the paper/electronic forms created by IEA WinW3S to list and track teachers. These methods varied from online forms to special software provided to schools or already existing in schools. Regarding data protection and confidentiality laws, 13 countries/territories reported restrictions on using teacher names on the listing and tracking forms and the national questionnaires. These countries/territories, plus another 16, used numbers or codes on the forms instead.

### 7.5.2. Contacting schools/ECEC settings

In 32 of the participating countries/territories, NPMs typically made first contact with sampled schools/ECEC settings, although in 16 countries/territories, the NPMs and other members of the national centre did this task together. In 12 countries/territories, the ministry of education made first contact, sometimes in conjunction with the national centre.

Although the overall participation rates for TALIS 2024 were high, 32 national centres reported difficulties in convincing schools/ECEC settings to participate. The most reported reason cited by 16 national centres was a high workload. Eleven national centres noted general survey fatigue, four reported doubts about the usefulness of the survey and four stated lack of human resources. Strategies to overcome school/ECEC setting reluctance to participate included multiple follow-up attempts and seeking the support of teacher unions, provider associations, ministries of education or regional, state or national authorities. Twenty-one of the participating countries/territories requested an extension for the data collection beyond the international data collection period to improve the overall response rate. Participation rates show that

most of the national centres were able to overcome these difficulties and convince schools/ECEC settings to take part in the survey.

Fifty-two national centres reported that it was easy to identify and appoint a suitable person to fill the role of school/ECEC setting co-ordinator. For 44 national centres, adapting the School/ECEC Setting Co-ordinator Manual to their national context and needs was a straightforward and easy task; 13 NPMs reported some difficulties, such as adapting cultural specifics or shortening the manual. Because the co-ordinators played a key role within the survey, 34 NPMs provided them with additional formal training, while 23 used different communication channels, such as phone calls and written instructions. National centres also used emails to explain single tasks at the appropriate times throughout the survey process and videos to inform school/ECEC setting co-ordinators.

### **7.5.3. Listing teachers/ECEC staff**

Due to the complexity of the listing procedure, 36 national centres found cases where school/ECEC setting co-ordinators listed teachers/ECEC staff incorrectly. Nine national centres reported one or more difficulties in explaining certain topics to the school/ECEC setting co-ordinators during the listing process: nine NPMs said that they experienced difficulties in explaining the definition of the teacher/ECEC staff population, five national centres reported that co-ordinators experienced challenges in correctly assigning the main subject domains/ECEC staff categories. However, national centres managed to resolve nearly all these issues before survey administration began.

### **7.5.4. Preparing the questionnaires**

Mindful that translation and adaptation of survey instruments is a difficult exercise in any cross-national survey, the ISC supported the process by preparing individualised timelines for instrument preparation, additional support materials (e.g. eight instructional videos) and guidelines (e.g. Instrument Assembly Guide). Overall, 41 national centres said that documentation of the non-structural national adaptations (i.e. adaptations of terms or words that did not affect the structure of the questionnaires) was a straightforward task. Sixteen national centres experienced difficulties, mainly because they saw the process as time-consuming or found the guidelines not clear enough.

The SAQs comments on structural adaptations (i.e. adaptations that changed the structure of the questionnaires by, for example, adding or deleting questions, dimensions or categories) presented a similar picture. Thirty-seven national centres reported no difficulties with the task, while 20 reported difficulties, mainly due to the complexity of implementing structural adaptations within the IEA StudyExpert software or new staff who had to familiarise themselves with the software during main survey preparation.

Regarding translations, 34 national centres considered the process as not being difficult at all, while the remainder described it as “somewhat difficult”. Most reported difficulties related to certain translated terms and concepts that were difficult to apply within the national context or to align in meaning across different survey languages. Fifty-five national centres considered the translation guidelines within Survey Operations Procedures Unit 3 useful for facilitating the completion of the task.

Fifty national centres found the instructional videos to support instrument preparation useful, and 54 felt that the webinars related to the tasks to be accomplished within IEA StudyExpert were useful.

### **7.5.5. Online administration**

During the main survey, no severe technical issues were experienced and the online dissemination platform worked very well. However, 33 countries/territories reported some difficulties concerning the login procedures. Most of these difficulties emerged from user errors (e.g. entering the URL into a search engine or command line of the browser, typos when entering the URL) or lost login details.



Some participants reported difficulties in accessing the questionnaires due to a slow Internet connection or specific browsers. In some cases, firewall blockings and pages loading slowly were reported. ISC staff worked closely with the national centres to provide technical support and resolve problems.

To monitor the online data collection process and participation progress regularly, the ISC provided a tool called Participation Monitor within IEA StudyExpert. This tool proved very helpful and the participating countries/economies used it several times a week during the data collection period. Thirty-eight national centres used the Participation Monitor at least once per day, while 17 national centres used it once or a few times a week. Fifty-four national centres characterised the Participation Monitor as a useful tool.

#### **7.5.6. Paper administration**

While most data were collected online, 13 TALIS 2024 participating countries/territories prepared paper questionnaires for administration. One country administered exclusively paper instruments, 12 chose a mixed-mode approach, that is, paper and online instruments (with the paper questionnaires either as a fall-back solution or using paper and online instruments in parallel).

#### **7.5.7. Manual data entry and submission**

National centres received training in performing manual data entry according to the rules and standards outlined in the Survey Operations Procedures Unit 5: Data Capture Procedures, the TALIS 2024 Technical Standards and in using the IEA Data Management Expert (DME) software. Of the 13 countries/territories that prepared paper versions of the questionnaires, only 8 actually used them and submitted the corresponding data. One national centre submitted their data and documentation by 20 April 2024 (as scheduled), seven national centres provided the required information between May and August 2024. As an important quality control measure, national centres were required to perform double entry of a sampled set of teacher/ECEC staff and principal/leader questionnaires to ensure high-quality data entry.

### **7.6. National quality observation programme**

NPMs were instructed to implement a national quality observation programme during administration of the TALIS 2024 field trial and main survey data collection; the design of the quality observation programme remained at the discretion of each country/territory. National quality observations are an important means not only of collecting information about survey administration and implementation at schools/ECEC settings but also of helping to ensure the quality and comparability of the data collected in each country/territory. The ISC asked NPMs to use the relevant section of the SAQs to summarise and report salient findings from the national quality observations. However, the NPMs were not required to submit data collected by the NQOs to the ISC. Each national centre was responsible for designing its own quality observation programme, appointing NQOs and ensuring that they met required standards relating to data collection and survey administration. The ISC developed an NQO manual template containing detailed instructions that would not only help NPMs conduct national quality observation but also serve as the basis for training the NQOs.

The National Quality Observer Manual (NQO) could be adapted to fit the needs of the country/territory with respect to how it would collect their data, such as accommodating international components or covering features important for the national centres (e.g. communication at the national level or online resources for school co-ordinators). NQOs were mainly appointed from among national centre staff but they also included graduate students, university staff, external persons or retired school/ECEC staff. According to the SAQ, 44 countries/economies implemented a national quality control programme for the main survey. National centres in 13 countries/territories did not conduct a quality observation programme at the national level but opted to use other ways of observing survey operations and activities. These approaches included

maintaining ongoing telephone contact with schools/ECEC settings to receive real-time feedback or asking school/ECEC setting co-ordinators to complete an online questionnaire.

Altogether, 44 countries/territories used the manual template supplied by the ISC, with 17 national centres applying significant adaptations, such as editing, adding and/or omitting questions. NQOs conducted approximately 20 interviews with school/ECEC setting co-ordinators per country/territory. Challenges observed by some quality observers at the national level varied. The NQOs reported the following main points: the questionnaires were experienced as too long (10), the survey was felt as an additional burden for schools/ECEC settings (8) and the concept of TALIS was not clear (4).

### **7.6.1. Future improvements in quality control**

Information regarding the quality of the data collected was gathered through multiple sources: the international quality observation programme, extra quality control questions, national quality observation programme implemented by national centres, and a follow-up SAQ administered online.

Overall, findings from these programmes indicated that most participating countries and territories adhered closely to the international survey procedures, thereby supporting cross-national comparability of the data. Nevertheless, each quality assurance programme revealed specific areas for improvement.

#### *International quality observation programme*

For the international quality observation programme, observers reported that they occasionally lacked a clear understanding of the school/ECEC settings and teacher/staff selection procedures. This sometimes resulted in misinterpretation of questions related to roles and responsibilities, requiring further clarification of the data submitted by the observers. Additionally, the co-ordinators manual review proved challenging and time-consuming, particularly in identifying significant differences between the international and national versions. To address these issues in future cycles, it is recommended that observers receive enhanced training on and understanding of within-school/setting sampling procedures, and that the manual review process be simplified. These adjustments aim to improve the accuracy of observations and reduce the burden on observers.

#### *Extra quality control questions*

The extra quality control questions were useful in evaluating the overall quality of the TALIS administration. Some questions should be modified or adapted in future rounds to address the issues with interpretation reported. In addition, it could be useful to tailor the questions to specific aspects of quality of interest in future TALIS cycles.

#### *The Survey Activities Questionnaire*

The SAQ proved to be a valuable tool during both the field trial and main survey, effectively capturing NPMs' insights on survey implementation and their recommendations for improvement.

To facilitate earlier and more targeted feedback from countries/territories, it is recommended to distribute the SAQ in smaller sections aligned with specific phases of the survey. This phased approach may help to identify and resolve issues as they arise, contributing to smoother implementation and continuous quality improvement.

#### *National quality control programme*

Although the implementation of a national quality observation programme was requested, not all countries/territories conducted one during the field trial and main survey. For future cycles, it is recommended to re-emphasise the importance of the national quality observation programme – particularly

during the field trial phase – to identify and address potential issues early on. This includes challenges related to teacher/staff listing and within-school or within-setting sampling. Early detection through the national quality observation programme allows for timely adjustments to procedures before the main survey, thereby supporting overall data quality and implementation consistency.

## Note

<sup>1</sup> Please note that information about the number of schools/ECEC settings that declined participation was not collected by IQOs during the interview with the NPM.

# 8

## Creating and checking the international databases

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This chapter describes the common and specific approaches adopted to construct the national and international databases for the core OECD Teaching and Learning International Survey (TALIS), the Teacher Knowledge Survey and TALIS Starting Strong. It outlines the procedures conducted by the national centres and the exchange of data and documentation with the international study centre. The chapter further describes the integration of data collected through online and paper administration modes, as well as the editing and database construction processes implemented to ensure data quality. Particular attention is given to the identification and resolution of data inconsistencies. The chapter concludes with a description of the interim data sets produced and the collaborative efforts taken by all involved centres to validate the accuracy, integrity and completeness of the data in the national, restricted-use and public-use databases.

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## 8.1. Overview

Creating the national and international databases for the core OECD Teaching and Learning International Survey (TALIS), the Teacher Knowledge Survey (TKS) and the Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) as well as ensuring their integrity required close co-ordination and co-operation among the international study centre (ISC), the national project managers (NPMs), consortium partners and the OECD Secretariat. In many, yet not all cases, national centres nominated a national data manager (NDM), who was the main focal point for data work between the national and international levels. The main responsibility of NPMs and NDMs was to manage data collection and submit accurate data for processing by the ISC at the international level.

The primary goals of this work were to ensure that:

- all originally collected data were complete and accurate
- all national adaptations to instruments were reflected accurately in the codebooks and corresponding documentation
- all information eventually conformed to the international data structure and code schemes
- any errors, such as logical inconsistencies or implausible values given by respondents or those occurring during data entry were minimised to the extent possible.

The processes and related quality control applied throughout were identical, to the extent feasible, for all target populations and surveys, i.e. TALIS core survey (International Standard Classification of Education (ISCED) levels 1, 2 and 3), the TKS and TALIS Starting Strong (children under the age of three [U3] and ISCED level 02). The TALIS core survey had established approaches applied with some adaptation to this fourth cycle. TALIS Starting Strong used established approaches from the 2018 cycle. The TKS is a new addition to the TALIS programme and largely used identical checks and edits as applied to the TALIS core survey given the overlap of measures and questions. Adjustments were required for questions asked exclusively in the TKS, such as the items used to assess teachers' general pedagogical knowledge (GPK) and a set of measures related to opportunities to learn (OTLs).

The ISC provided each participating country/territory with the International Association for the Evaluation of Educational Achievement (IEA) Within-School Sampling Software (WinW3S). IEA WinW3S supported all within-school/setting sampling operations, produced the necessary listing and tracking forms, and stored key information such as login credentials and information for questionnaire labels. A built-in participation rate estimator allowed national centres to estimate and monitor response rates during the field work. Chapter 5 describes these steps in full detail.

To familiarise NPMs and NDMs with their tasks and responsibilities, the ISC conducted a three-day data management training course in Hamburg, Germany, in August 2022 prior to the field trial (FT). The training focused on data sources and software use, procedures for national adaptations and mapping to international codes, as well as procedures for data entry, verification and submission. Following the administration of the FT in early 2023, NPMs and NDMs were informed of the outcomes as well as and process updates, software enhancements and other changes during the third NPM meeting, held in Ljubljana, Slovenia, in September 2023 prior to the main survey. NPMs were also updated on the progress of data management at all scheduled NPM meetings and webinars. Finally, national centre staff received a comprehensive memo on data use and reporting standards as non-public internal resource and were additionally convened for a comprehensive workshop on data analysis and use in Hamburg, Germany, in May 2025.

## 8.2. Online data collection and verification

The proportion of data collection conducted online increased steadily over the three previous TALIS cycles (2008, 2013 and 2018). In TALIS 2024, online administration became the default mode of data collection and was facilitated by the IEA StudyExpert platform (see Chapter 6 for further details). Paper questionnaires were still available for those participating countries/territories that requested this mode. National centres were required to provide individuals who either refused to participate in the online mode or lacked Internet access with a paper questionnaire, with an aim to minimise non-response. The TKS assessment was available exclusively in the online administration mode. Most TALIS core survey countries/territories relied solely on the online mode for data collection, while a single country used only the paper format. The remainder adopted a mixed-mode approach, combining online and paper questionnaires for particular educational levels, populations or specific school settings. In the case of TALIS Starting Strong, the majority of participants used the online mode exclusively, with the rest implementing a mixed-mode design (see Chapter 7 for further details).

The use of two parallel modes of data collection can be a potential source of errors and can affect comparability of the data. Measures were put in place to minimise these errors to the extent possible. In particular, to ensure uniform and comparable conditions across modes and across participating countries/territories, questionnaires in both modes were self-administered and comparable in terms of question sequence, layout and appearance; the same sample design and procedures were used to identify respondents; the same methods were used to contact respondents and to validate their participation; and both modes of data collection occurred over the same period of time.

The navigational design of the online questionnaire was developed to resemble the familiar experience of completing a paper questionnaire. In the data collection system, respondents could move between pages/screens using “Next” and “Previous” buttons, simulating the action of turning physical pages. In contrast to paper, a hyperlinked list of questions was available in the left-most panel of the delivery system. Each question/page was colour-coded (red for questions not answered, green for questions answered) to indicate completion status, allowing respondents to easily identify which questions were answered or skipped. The majority of respondents followed the questionnaire in sequential order, yet this navigation aid allowed them to skip or return to questions freely, further mimicking the flexibility of a self-administered paper instrument.

Despite efforts to harmonise the administration modes, notable differences in how the survey was experienced by respondents remained. To reduce respondent burden and survey complexity, the online survey automatically skipped questions not applicable to the respondent based on their responses, in contrast to the paper questionnaire, which instructed respondents to proceed to the next applicable question. Rather than presenting multiple questions per page, the online questionnaire proceeded question by question, with each located on an individual page in the browser. While vertical scrolling was potentially required for some longer questions (especially on smaller devices), horizontal scrolling was never necessary.

National centres were able to monitor online participation through a secure progress and statistics module as part of the wider IEA StudyExpert system. This feature gave national centres access to a range of monitoring reports and real-time progress once the instruments were deployed. Results were displayed in a grid format with functionalities for sorting and filtering data by column, enabling detailed inspection of participation indicators such as first and last login, number of logins and response progress. For ease of review, full cell content could be viewed by hovering the cursor over truncated entries. All displayed results could be exported in Microsoft Excel or comma-separated values (CSV) format using the export function. The access to the progress and statistics module was designed to support local follow-up activities while protecting data confidentiality; NPMs or NDMs did not have access to individual responses. Chapter 6 provides further information on the field operations and monitoring progress.

### 8.3. Data entry and verification of paper questionnaires and tracking information

Each national centre was responsible for transcribing any information from paper questionnaires using a standard data capture software, the IEA Data Management Expert (IEA DME), as well as from tracking forms into the aforementioned IEA WinW3S.

National centres entered responses into data files created against a pre-prepared national codebook, accounting for national adaptations and extension made to the questionnaires. The codebook contained information about the names, lengths, labels, valid ranges (for continuous measures or counts) or valid values/codes (for nominal or ordinal questions) and missing codes for each variable. Before data entry commenced, national centres were required to verify this national codebook, which then served as templates for creating the corresponding dataset.

The ISC instructed national centres to discard any returned paper questionnaires that were unused or returned completely empty, and to enter data from any returned questionnaire that contained at least one valid response. To ensure consistency across participating countries and territories, data entry was required to be “as is”, that is without any interpretation, correction, omission, imputation or other cleaning. Any inconsistencies that remained after this data-entry stage were managed at the time of data cleaning (see below).

Key rules for data entry from paper included:

- Responses to categorical single-choice questions were generally coded as “1” if the first option (checkbox) was marked, “2” if the second option was marked, and so on.
- Responses to individual items in “check-all-that-apply” questions were initially coded as either “1” (marked) or “9” (omitted or invalid).
- Responses to numerical or count questions (e.g. school enrolment) were entered “as is”, that is, without any correction or truncation, even if a value was outside the originally expected range.
- Likewise, responses to filter questions and filter-dependent questions were entered exactly as filled in by the respondent, even if the information provided was logically inconsistent with a filter and in a non-applicable path.
- If responses were not given at all, not given in the expected format, ambiguous or conflicting in any other way (e.g. selection of two options in a single-choice question), the corresponding variable was coded as “Omitted or invalid”.

Data entered into the IEA DME software were automatically validated. First, any entered respondent identifier (ID) was validated against the checksum generated by the IEA WinW3S software. Any mistake in either the ID or the checksum resulted in an error message that prompted the data-entry person to check and correct the entered values. The data verification module of IEA DME also enabled identification of a range of problems, such as inconsistencies in identification codes and out-of-range or otherwise invalid codes. These potential problems had to be resolved or confirmed before data entry could resume.

To verify the reliability of data entry in participating countries/territories, national centres were required to double-enter at least 5% of the completed teacher and principal questionnaires, or a minimum of 100 questionnaires for each instrument. This involved at least two different data-entry staff entering the same questionnaires into separate datasets independently. Once the required number of cases had been entered into the respective datasets, the national centre was mandated to compute the data-entry quality check, which compared datasets by cross-checking the values of all variables on matched IDs. Also, national centres were encouraged to begin the process early, enabling the timely detection of any systematic or incidental data-entry errors. It also served as a training tool to identify data-entry staff who might need further instruction.



An error rate of 1% or less was considered acceptable. Any discrepancy above 1% required reporting to the ISC for further discussion and typically necessitated re-entry of the data. This procedure helped ensure that the margin of error in the processed datasets remained well below the defined threshold for quality assurance.

Before sending the data to the ISC for international processing, national centres conducted mandatory verification steps on all entered data from paper questionnaires and undertook corrections, as necessary. The corresponding checks were included in the IEA DME software, and the data were systematically checked for duplicate identification codes, data outside the expected valid range or values defined as valid. National centres reviewed the corresponding reports, resolved any inconsistencies and, where possible, corrected problems by looking up the original survey questionnaires. National centres also verified that all returned non-empty questionnaires were, in fact, entered and that the availability of data corresponded to the participation indicators on any of the tracking forms.

Parallel to the data entry from questionnaires, national centres reviewed the information from the tracking forms to verify completeness of materials, then entered the participation information (i.e. whether respondents participated or left the school/setting permanently between the time of sampling and the time of administration) into IEA WinW3S.

In addition to submitting the data files described above, national centres provided the ISC with further documentation, including hard copies or electronic scans of listing and tracking forms, copies of the paper instruments used and a report on the data-entry work via the survey activities questionnaire (SAQ).

#### 8.4. Data integration, checking, editing and quality control at the ISC

Once national centres submitted their data to the ISC, data integration, processing and cleaning commenced to ensure completeness, consistency, accuracy and alignment with the international data structure. The key objective of this process was to ensure that data adhered to internationally comparable formats and that information from respondents was complete, could be linked across different sources and levels, and that the data accurately reflected the information collected within each participating country/territory.

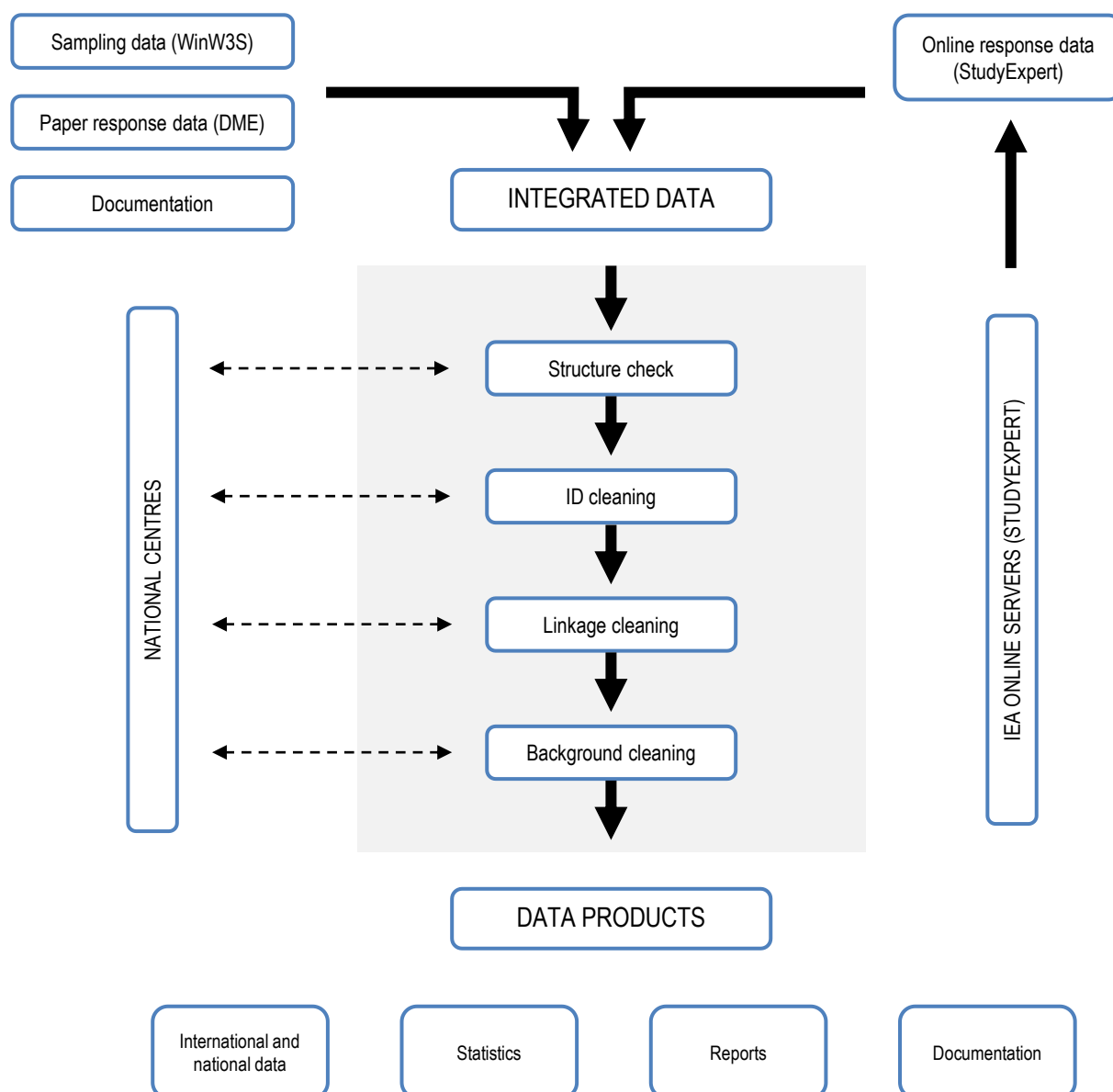
A complex survey project such as TALIS 2024 and its various components and populations required a correspondingly complex data-cleaning setup and design. The ISC employed and adapted a version of its proprietary IEA Data Processing Expert (DPE) software, developed as a dedicated data processing platform using relational structured query language (SQL) databases and, where appropriate, with custom R scripts and code to provide specific functionality for TALIS. These systems were designed to automate and standardise the data integration and cleaning process. The ISC implemented a controlled sequence of procedures to ensure that all steps were executed in the correct order, that any specific data requirements were addressed and that the cleaning process remained independent of the persons in charge.

- All data processing systems and steps were thoroughly tested using simulated data containing the problems or inconsistencies that could be expected from the TALIS survey design.
- All incoming data and documentation were registered in a material receipt database along with the date of receipt and any specific information meriting attention later.
- All detected deviations from the international data structure resulting from national adaptations or extensions were cross-checked against the information provided by the countries/territories in the IEA StudyExpert instrument adaptation module, national instruments and codebooks.
- All general data processing and editing were organised according to rules consistently applied to all national datasets.

- All systematic or case-level corrections made to data were implemented and recorded in specific cleaning reports that the national centres reviewed and approved.

Figure 8.1 provides a schematic overview of this iterative process conducted in co-operation with the national centres. The following subsections of this chapter give a more detailed description of the sequential data-cleaning steps displayed in Figure 8.1.

**Figure 8.1. Data processing at IEA Hamburg**



### 8.4.1. Import, documentation and structure check

Data processing began with a review of the submitted data files and accompanying documentation, including the completed tracking forms. Most participating countries/territories submitted all required materials alongside their data, which facilitated this initial check. In accordance with national legislation and technical standards, any directly identifying clear text names had to be removed or redacted from the tracking forms before submission. Copies of tracking forms were routinely submitted electronically with national centres retaining the originals for their own reference and archive. For cases where documentation or data were incomplete or contradicting, the ISC followed up directly with the national centres to obtain the missing information. Once all necessary materials were received, the actual data processing proceeded.

All available data were imported from the respective sources and merged. This included online response data collected through the IEA StudyExpert system, paper response data entered into the IEA DME software, and sampling and tracking information generated through or entered into IEA WinW3S. At this stage, data from the online and paper administration modes were structurally harmonised and verified for consistency, ensuring that all datasets used the same valid and missing codes. This early integration allowed all records to be processed uniformly through the same data checks and procedures.

During import and integration, no within-case validation was conducted, yet all records were reviewed and filtered to ensure that only one record existed per respondent. This was particularly relevant for cases in which conflicting records were submitted, often where a respondent began the survey in one language and changed to another one later. Duplicate records were resolved systematically and, in most cases automatically, using the following steps:

- Detect all respondents with two or more records.
- Remove any record with no valid responses, retaining the record holding valid responses.
- Where responses exist in multiple records, compare the rate of completion (total responses provided divided by total responses expected), then drop records that are at least 0.5 percentage points less complete than others with the same ID.
- If records had similar completion rates, remove the one with less completion and an earlier timestamp.
- If still unresolved, drop the record with the earlier timestamp.

This process ensured that only the most complete and relevant data were retained for each respondent, thereby supporting the accuracy and reliability of subsequent processing steps. In the TALIS core survey and TKS, 947 duplicate cases were initially identified and addressed, while 79 such cases were handled using the same procedure in TALIS Starting Strong. Duplicate cases could only occur in countries/territories where the survey was administered in more than one language. Most issues occurred when respondents logged in, often answering no or only few questions, and then switched to another language version for reasons of familiarity or convenience.

For TALIS Starting Strong, responses collected through the Combined Questionnaire Main (CQ-M) and Combined Questionnaire Short (CQ-S) were allocated to the leader and/or staff databases based on predefined item mapping at the stage of instrument design (Tables 8.1 and 8.2). Although the two combined questionnaires were administered as separate instruments, their items were designed to correspond to constructs and variables relevant for leaders and/or staff. Using this mapping, all records were fully allocated to the corresponding target dataset(s) and the data from the combined questionnaires were not maintained as a separate dataset from that point onward. This approach ensured that the leader and staff datasets included all intended records and subsequent processing steps were implemented consistently regardless of the origin of data.

**Table 8.1. Combined Questionnaire Main (CQ-M) mapping to Leader (LQ) and/or Staff (SQ) Questionnaire**

| Question number<br>in CQ-M | Question number<br>in SQ | Item mapping<br>CQ-M to SQ                                           | Question number<br>in LQ | Item mapping<br>CQ-M to LQ                                                                               |
|----------------------------|--------------------------|----------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------|
| 1                          | 1                        | Exact                                                                | 1                        | Exact                                                                                                    |
| 2                          | 2                        | Exact                                                                | 2                        | Exact                                                                                                    |
| 3                          | 5                        | Exact                                                                |                          |                                                                                                          |
| 4                          | 8                        | Exact                                                                |                          |                                                                                                          |
| 5                          |                          |                                                                      | 5                        | Exact                                                                                                    |
| 6                          | 9                        | Exact                                                                |                          |                                                                                                          |
| 7                          | 10                       | Exact                                                                |                          |                                                                                                          |
| 8                          | 11                       | Exact                                                                | 3                        | c → b<br>d → c<br>e → d<br>f → e<br>g → f<br>h → g<br>i → h<br>j → i                                     |
| 9                          |                          |                                                                      | 4                        | Exact                                                                                                    |
| 10                         | 12                       | Exact                                                                |                          |                                                                                                          |
| 11                         | 13                       | Exact                                                                |                          |                                                                                                          |
| 12                         | 14                       | Exact                                                                |                          |                                                                                                          |
| 13                         |                          |                                                                      | 13                       | Exact                                                                                                    |
| 14                         |                          |                                                                      | 14                       | Exact                                                                                                    |
| 15                         |                          |                                                                      | 15                       | Exact                                                                                                    |
| 16                         |                          |                                                                      | 16                       | Exact                                                                                                    |
| 17                         |                          |                                                                      | 18                       | Exact                                                                                                    |
| 18                         |                          |                                                                      | 19                       | Exact                                                                                                    |
| 19                         |                          |                                                                      | 20                       | Exact                                                                                                    |
| 20                         |                          |                                                                      | 21                       | Exact                                                                                                    |
| 21                         |                          |                                                                      | 22                       | Exact                                                                                                    |
| 22                         |                          |                                                                      | 23                       | Exact                                                                                                    |
| 23                         |                          |                                                                      | 24                       | Exact                                                                                                    |
| 24                         |                          |                                                                      | 25                       | Exact                                                                                                    |
| 25                         |                          |                                                                      | 26                       | Exact                                                                                                    |
| 26                         |                          |                                                                      | 27                       | Exact                                                                                                    |
| 27                         |                          |                                                                      | 28                       | Exact                                                                                                    |
| 28                         |                          |                                                                      | 29                       | Exact                                                                                                    |
| 29                         | 15                       | Exact                                                                |                          |                                                                                                          |
| 30                         | 17                       | Exact                                                                |                          |                                                                                                          |
| 31                         | 18                       | Exact                                                                |                          | Exact                                                                                                    |
| 32                         | 19                       | p → g<br>q → h<br>r → i<br>s → j<br>t → k<br>u → l<br>v → m<br>w → o | 11                       | a → a<br>b → b<br>c → c<br>d → d<br>e → e<br>f → f<br>g → g<br>h → h<br>i → i<br>j → j<br>k → k<br>l → l |

| Question number<br>in CQ-M | Question number<br>in SQ | Item mapping<br>CQ-M to SQ                                                                      | Question number<br>in LQ | Item mapping<br>CQ-M to LQ                                                             |
|----------------------------|--------------------------|-------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------|
|                            |                          |                                                                                                 |                          | m → m<br>n → n<br>o → o                                                                |
| 33                         | 20                       | a → a<br>b → b<br>c → c<br>d → d<br>e → e<br>f → f<br>g → h<br>h → i<br>i → j<br>j → k<br>k → l | 12                       | a → a<br>b → b<br>c → c<br>e → d<br>f → e<br>g → f<br>h → g<br>i → h<br>j → i<br>k → j |
| 34                         |                          |                                                                                                 | 30                       | Exact                                                                                  |
| 35                         |                          |                                                                                                 | 31                       | Exact                                                                                  |
| 36                         |                          |                                                                                                 | 32                       | Exact                                                                                  |
| 37                         |                          |                                                                                                 | 33                       | Exact                                                                                  |
| 38                         |                          |                                                                                                 | 34                       | Exact                                                                                  |
| 39                         |                          |                                                                                                 | 35                       | Exact                                                                                  |
| 40                         |                          |                                                                                                 | 36                       | Exact                                                                                  |
| 41                         |                          |                                                                                                 | 37                       | Exact                                                                                  |
| 42                         |                          |                                                                                                 | 38                       | Exact                                                                                  |
| 43                         |                          |                                                                                                 | 39                       | Exact                                                                                  |
| 44                         | 43                       | Exact                                                                                           |                          |                                                                                        |
| 45                         | 24                       | Exact                                                                                           |                          |                                                                                        |
| 46                         |                          |                                                                                                 | 40                       | Exact                                                                                  |
| 47                         | 27                       | Exact                                                                                           |                          |                                                                                        |
| 48                         | 29                       | Exact                                                                                           |                          |                                                                                        |
| 49                         | 30                       | Exact                                                                                           |                          |                                                                                        |
| 50                         | 31                       | Exact                                                                                           |                          |                                                                                        |
| 51                         | 33                       | Exact                                                                                           |                          |                                                                                        |
| 52                         | 34                       | Exact                                                                                           |                          |                                                                                        |
| 53                         | 35                       | Exact                                                                                           |                          |                                                                                        |
| 54                         | 36                       | Exact                                                                                           |                          |                                                                                        |
| 55                         | 37                       | Exact                                                                                           |                          |                                                                                        |
| 56                         | 38                       | Exact                                                                                           |                          |                                                                                        |
| 57                         | 39                       | Exact                                                                                           |                          |                                                                                        |
| 58                         | 40                       | Exact                                                                                           |                          |                                                                                        |
| 59                         | 41                       | Exact                                                                                           |                          |                                                                                        |
| 60                         |                          |                                                                                                 | 41                       | Exact                                                                                  |
| 61                         |                          |                                                                                                 | 42                       | Exact                                                                                  |
| 62                         | 45                       | a → a<br>b → b<br>c → c<br>e → d<br>f → e<br>g → h<br>h → f<br>k → i<br>l → j<br>m → k<br>n → l | 43                       | a → a<br>c → d<br>d → c<br>f → e<br>i → f<br>j → g<br>m → h<br>n → i                   |
| 63                         |                          |                                                                                                 | 44                       | Exact                                                                                  |

| Question number<br>in CQ-M | Question number<br>in SQ | Item mapping<br>CQ-M to SQ                                                                                        | Question number<br>in LQ | Item mapping<br>CQ-M to LQ                         |
|----------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------|
| 64                         | 47                       | a → a<br>b → b<br>c → c<br>d → d<br>e → e<br>g → f<br>h → g<br>i → h<br>j → l<br>k → j<br>l → k<br>m → l<br>n → m | 45                       | c → a<br>e → b<br>f → c<br>h → e<br>i → f<br>n → i |
| 65                         | 48                       | a → b<br>b → c<br>c → d<br>d → e<br>e → f<br>f → g<br>g → h                                                       |                          |                                                    |

**Table 8.2. Combined Questionnaire Short (CQ-S mapping to Leader (LQ) and/or Staff (SQ) Questionnaire**

| Question number<br>in CQ-S | Question number<br>in SQ | Item mapping<br>CQ-S to SQ | Question number<br>in LQ | Item mapping<br>CQ-S to LQ                                                                |
|----------------------------|--------------------------|----------------------------|--------------------------|-------------------------------------------------------------------------------------------|
| 1                          | 1                        | Exact                      | 1                        | Exact                                                                                     |
| 2                          | 2                        | Exact                      | 2                        | Exact                                                                                     |
| 3                          | 4                        | Exact                      |                          |                                                                                           |
| 4                          | 3                        | Exact                      |                          |                                                                                           |
| 5                          | 5                        | Exact                      |                          |                                                                                           |
| 6                          | 8                        | Exact                      |                          |                                                                                           |
| 7                          |                          |                            | 6                        | Exact                                                                                     |
| 8                          | 9                        | Exact                      |                          |                                                                                           |
| 9                          | 10                       | Exact                      |                          |                                                                                           |
| 10                         | 11                       | Exact                      | 3                        | Code:<br>1/2 → 1<br>3 → 2<br>4 → 3<br>5 → 4<br>6 → 5<br>7 → 6<br>8 → 7<br>9 → 8<br>10 → 9 |
| 11                         | 12                       | Exact                      |                          |                                                                                           |
| 12                         | 13                       | Exact                      |                          |                                                                                           |
| 13                         | 14                       | Exact                      |                          |                                                                                           |
| 14                         |                          |                            | 13                       | Exact                                                                                     |
| 15                         |                          |                            | 14                       | Exact                                                                                     |
| 16                         |                          |                            | 15                       | Exact                                                                                     |
| 17                         |                          |                            | 18                       | Exact                                                                                     |
| 18                         |                          |                            | 20                       | Exact                                                                                     |

| Question number<br>in CQ-S | Question number<br>in SQ | Item mapping<br>CQ-S to SQ                                                             | Question number<br>in LQ | Item mapping<br>CQ-S to LQ                |
|----------------------------|--------------------------|----------------------------------------------------------------------------------------|--------------------------|-------------------------------------------|
| 19                         |                          |                                                                                        | 21                       | Exact                                     |
| 20                         |                          |                                                                                        | 25                       | Exact                                     |
| 21                         |                          |                                                                                        | 26                       | Exact                                     |
| 22                         |                          |                                                                                        | 27                       | Exact                                     |
| 23                         | 15                       | a → a<br>b → b<br>c → c<br>d → d<br>e → f<br>f → g<br>g → h<br>h → i                   |                          |                                           |
| 24                         | 16                       | Exact                                                                                  |                          |                                           |
| 25                         | 17                       | Exact                                                                                  |                          |                                           |
| 26                         | 19                       | Exact                                                                                  |                          |                                           |
| 27                         | 20                       | a → a<br>b → b<br>c → c<br>d → d<br>e → e<br>f → f<br>g → h<br>h → i<br>i → j<br>j → k | 12                       | Exact                                     |
| 28                         | 43                       | Exact                                                                                  |                          |                                           |
| 29                         | 23                       | Exact                                                                                  |                          |                                           |
| 30                         | 24                       | Exact                                                                                  |                          |                                           |
| 31                         | 25                       | Exact                                                                                  |                          |                                           |
| 32                         | 27                       | Exact                                                                                  |                          |                                           |
| 33                         | 28                       | Exact                                                                                  |                          |                                           |
| 34                         | 29                       | Exact                                                                                  |                          |                                           |
| 35                         | 30                       | Exact                                                                                  |                          |                                           |
| 36                         | 31                       | Exact                                                                                  |                          |                                           |
| 37                         | 33                       | Exact                                                                                  |                          |                                           |
| 38                         | 35                       | Exact                                                                                  |                          |                                           |
| 39                         | 37                       | Exact                                                                                  |                          |                                           |
| 40                         | 38                       | Exact                                                                                  |                          |                                           |
| 41                         | 39                       | Exact                                                                                  |                          |                                           |
| 42                         | 40                       | Exact                                                                                  |                          |                                           |
| 43                         | 41                       | Exact                                                                                  |                          |                                           |
| 44                         |                          |                                                                                        | 33                       | Exact                                     |
| 45                         |                          |                                                                                        | 34                       | Exact                                     |
| 46                         |                          |                                                                                        | 37                       | Exact                                     |
| 47                         |                          |                                                                                        | 38                       | Exact                                     |
| 48                         |                          |                                                                                        | 39                       | Exact                                     |
| 49                         |                          |                                                                                        | 41                       | a → b<br>b → c                            |
| 50                         |                          |                                                                                        | 42                       | a → a<br>b → b<br>c → c<br>d → d<br>e → e |



| Question number<br>in CQ-S | Question number<br>in SQ | Item mapping<br>CQ-S to SQ                                                                                                                                                                                     | Question number<br>in LQ | Item mapping<br>CQ-S to LQ                                                                                                 |
|----------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------|
|                            |                          |                                                                                                                                                                                                                |                          | $f \rightarrow f$<br>$g \rightarrow g$<br>$h \rightarrow h$<br>$i \rightarrow p$                                           |
| 51                         | 45                       | $a \rightarrow a$<br>$b \rightarrow b$<br>$c \rightarrow c$<br>$d \rightarrow d$<br>$e \rightarrow e$<br>$f \rightarrow h$<br>$h \rightarrow i$<br>$i \rightarrow j$<br>$j \rightarrow k$<br>$k \rightarrow l$ | 43                       | $a \rightarrow a$<br>$c \rightarrow d$<br>$e \rightarrow e$<br>$g \rightarrow g$<br>$j \rightarrow h$<br>$k \rightarrow i$ |
| 52                         | 46                       | Exact                                                                                                                                                                                                          |                          |                                                                                                                            |
| 53                         | 47                       | Exact                                                                                                                                                                                                          | 45                       | $c \rightarrow a$<br>$d \rightarrow b$<br>$e \rightarrow c$<br>$g \rightarrow e$<br>$h \rightarrow f$<br>$m \rightarrow i$ |
| 54                         | 48                       | $a \rightarrow b$<br>$b \rightarrow c$<br>$c \rightarrow d$<br>$d \rightarrow e$<br>$e \rightarrow f$<br>$f \rightarrow g$<br>$g \rightarrow h$                                                                |                          |                                                                                                                            |

The next processing step was a structure check aimed to identify differences between the national and international record structures. The majority of participating countries/territories made structural adaptations and extensions to the questionnaires. The extent and nature of these adaptations and extensions varied greatly. Whereas some participating countries and territories administered the questionnaires without any or only minor changes, except for translations and necessary cultural adaptations, others adapted international questions, inserted new ones or opted out of certain questions or options. Given the risk of data loss when deviating from the international data structure, technical standards required national centres to follow strict rules.

Typical deviations reported during this step included unused international variables, added national variables, differences in variable lengths, added or removed response categories, and differences in coding schemes or validation rules. These deviations were systematically reviewed and cross-checked against the documented national adaptations. For online questionnaires, the vast majority of national adaptations were automatically mapped into variables and codes based on the comprehensive adaptation system in IEA StudyExpert. Where necessary, the ISC made additional modifications to align the data with the international design, such as recoding extra national options in multiple-choice questions to conform to the international coding scheme. The original national values were preserved in separate national variables for potential use in national reporting. For paper records, all mapping was performed manually. Additional systematic edits included: differentiating between “Omitted or invalid” and “Not administered”, and recoding values for unused international variables to “Not administered”.

NPMs and NDMs received detailed reports on structural deviations together with documentation on how the ISC resolved these. In a few cases, data were not available for certain variables because the corresponding question was not administered nationally. In some other instances, data had to be removed

because they were not internationally comparable due to errors in translation, adaptation or mapping that were only detected after the data had been collected. For more information, consult the *Teaching and Learning International Survey (TALIS) 2024 User Guide* (OECD, forthcoming<sup>[1]</sup>).

#### **8.4.2. Identification variable and linkage cleaning**

To uniquely identify, track and document each respondent and their corresponding questionnaire, each record in a data file must contain a unique identification number. In TALIS, the WinW3S software was used to assign these distinct IDs, whereas the IEA DME and StudyExpert systems received and validated these. It was crucial that records for primary sampling units (schools in the TALIS core survey and TKS, settings in TALIS Starting Strong) could then be linked to the records at the second level (teachers in the TALIS core survey and TKS, staff in TALIS Starting Strong). This linkage was implemented through a hierarchical ID numbering system, which was further cross-checked against tracking forms. After this step, the databases only included those primary sampling units marked as participating and with data available. The teacher and staff databases included only those records that were linked to one of these primary units.

Further ID cleaning focused on the consistency of tracking of information between the information used for listing, sampling and later tracking as well as the actual responses in the questionnaires. Whenever necessary, variables pertaining to teachers' or staff's listed gender, year of birth, exclusion and participation status were verified and checked against data availability and tracking forms.

The ISC required close co-operation with the national centres in order to resolve ID or linkage inconsistencies. For this purpose, national centres received standardised reports containing each identified inconsistency. Once the ISC had finalised the ID, linkage, participation and exclusion information, it transferred these data to the IEA's Sampling Team, which used this information to calculate participation rates, exclusion rates and estimation and replication weights.

#### **Resolving inconsistencies in questionnaire data**

After harmonising national data to the structure specified in the international codebooks, and after resolving all ID and linkage issues, the ISC applied a series of cleaning rules to the data. The process, conducted through scripts with the IEA DPE platform, identified and, in many cases, automatically corrected inconsistencies in the data. The ISC prepared detailed documentation of all checks and actions applied to the data and shared this documentation with national centres.

The classes of checks and actions are introduced below, and details are provided in the following sections, separately for the TALIS core survey/TKS and TALIS Starting Strong.<sup>1</sup>

- Filter questions, which appeared in the TALIS core survey, TKS and TALIS Starting Strong questionnaires, were used to direct respondents to a particular question or section of the questionnaire. Filter questions and their dependent questions were treated automatically in most cases. If a response to a filter question was equivalent to "No", meaning that the dependent questions were not applicable to that respondent, the dependent variables were set to "Logically not applicable" regardless of any values provided in any of the dependent questions and variables.
- "Check-all-that-apply" questions where all options within an item were marked as "Not checked", yet at least one response was expected, were consistently recoded to "Omitted/invalid". Similarly, if mutually exclusive and hence conflicting options within an item were marked as "Checked", all responses were recoded to "Omitted/invalid".
- For questions consisting of individual responses in percentage of a whole designed to add up to 100, constituent values were set to "Omitted or invalid" if the sum fell outside a 90 to 110 range (principal questionnaire PQ-12), or a 45 to 110 range (teacher questionnaire TQ-50). If any individual value was larger than 100, that value alone was set to "Omitted or invalid".

- Variables with implausible numerical values were also set to “Omitted or invalid”. For example, TQ-02 asked respondents about their age. Values below 18 were set to “Omitted or invalid”.
- Inconsistencies between the listed and actual responses regarding age and gender were resolved in a manner that only retained respondent-supplied information.<sup>2</sup>

The number of inconsistent or implausible responses in the data files varied from one participating country/territory to another, but no national dataset was completely free of inconsistent responses. Each problem was recorded in a database and identified by a unique ID. The entry also included a description of the problem and of the automatic action taken by the platform or the manual action taken by ISC staff. Staff referred issues that could not be corrected using systematic rules to the national centre so that they could check the original data collection instruments and tracking forms, trace the source of the inconsistency and recommend a remedy. Whenever possible, staff at the ISC proposed a solution and asked the national centre to either accept this or propose an alternative. Data files were then updated to reflect the agreed-upon solutions. Both systematic corrections and those applicable on a case-by-case basis were applied directly to scripts and executed automatically for each subsequent data run. If an NPM could not solve a problem by inspecting the instruments and forms or could not suggest a satisfying solution or explanation, the ISC in close consultation with the OECD Secretariat defined a final cleaning action.

### **8.4.3. Data editing actions for the TALIS core survey and TKS**

#### *Logically inconsistent filter/dependent responses*

- PQ-22/23, PQ-31/32, PQ-33/34, PQ-35/36/37.
- TQ-04/05/06/07, TQ-10/11, TQ-17/18, TQ-20/21/22, TQ-36/37/38, TQ-41/42, TQ-68/69.
- A special treatment was used for TQ-10/11 for weighting purposes and calculation of the teacher multiplicity factor (WGTADJ4) (see Chapter 9 for more details).
  - If TQ-10 is “Yes” (1) and TQ-11 is “Omitted or invalid” or zero (0) → recode TQ-10 to “No” (2) and TQ-11 to “Logically not applicable”.
  - If TQ-10 is “No” (2) and TQ-11 is zero (0) or one (1) → recode TQ-11 to “Logically not applicable”.
  - If TQ-10 is “No” (2) but TQ-11 is two (2) or more → recode TQ-10 to “Yes” (1).

#### *Check-all-that-apply questions with more than two items*

- PQ-24, PQ-25 and PQ-36.<sup>3</sup>
- TQ-48 and TQ-68.

#### *Out-of-range percentage sums*

- For PQ-12, the complete set of variables was set to “Omitted or invalid” if the sum of percentages fell outside the range of 90-110. If any individual variable exceeded 100%, that variable was set to “Omitted or invalid”.
- For TQ-50, the complete set of variables was set to “Omitted or invalid” if the sum of percentages fell outside the range of 45-110. As with the others, any individual variable above 100% was set to “Omitted or invalid”.

#### *Out-of-range/implausible numerical variables*

- PQ-02: if value is less than 18 → set to “Omitted or invalid”.
- PQ-04a-d: if years of experience is greater than age (PQ-02) minus 18 → set to “Omitted or invalid”.

- PQ-04e: if years of experience in any other job is larger than age (PQ-02) minus 14 → set to “Omitted or invalid”.
- PQ-04a-e: if age (PQ-02) is omitted and years of experience is larger than 79 → set to “Omitted or invalid”.
- PQ-14a and PQ-14d: if value is zero (0) → set to “Omitted or invalid”.
- PQ-17: if value is zero (0) → set to “Omitted or invalid”.
- PQ-49: if sum of self-reported principal age (PQ-02) and PQ-49 is greater than 100 → set to “Omitted or invalid”.
- TQ-02: if value is less than 18 → set to “Omitted or invalid”.
- TQ-05: if value is between 40 and 99 → add 1 900 so values are changed to 1 940-1 999; if value is not between 1 940 and 2 024 → set to “Omitted or invalid”.
- TQ-11: implausible values were reviewed and corrected in consultation with countries/territories, due to its influence on weighting.
- TQ-13a-c: if years of experience is greater than age (TQ-02) minus 18 → set to “Omitted or invalid”.
- TQ-13d: if years of non-education experience is greater than age (TQ-02) minus 14 → set to “Omitted or invalid”.
- TQ-13a-d: if age (TQ-02) is omitted and years of experience is greater than 79 → set to “Omitted or invalid”.
- TQ-14: if value is greater than 120 → set to “Omitted or invalid”.
- TQ-15: if value is greater than 120 → set to “Omitted or invalid”.
- TQ-16: if value is greater than 120 → set to “Omitted or invalid”.
- TQ-46: if enrolment is zero (0) or greater than 500 → set to “Omitted or invalid”.
- TQ-74: if sum of self-reported teacher age (TQ-02) and TQ-74 is greater than 100 → set to “Omitted or invalid”.

#### 8.4.4. Data editing actions for TALIS Starting Strong

##### *Logically inconsistent filter/dependent responses*

- LQ-07/08 and LQ-09/10.
- SQ-06/07, SQ-09/10, and SQ-12/13/14, SQ-15/16/17/18.
- The following treatment was applied to SQ-09/10:
  - If SQ-09 is “Yes” (1) and SQ-10 is “Omitted or invalid” or zero (0) → recode SQ-09 to “No” (2) and SQ-10 to “Logically not applicable”.
  - If SQ-09 is “No” (2) and SQ-10 is zero (0) or one (1) → recode SQ-10 to “Logically not applicable”.
  - If SQ-09 is “No” (2) but SQ-10 is two (2) or more → recode SQ-09 to “Yes” (1).

##### *Check-all-that-apply questions with more than two items*

- LQ-15 and LQ-26 (included in the leader, combined-main and combined-short questionnaires).

##### *Out-of-range percentage sums*

- For LQ-31, the complete set of variables was set to “Omitted” if the sum of percentages fell outside the range of 75-125.

### *Out-of-range/improbable numerical variables*

- LQ-02: if value is less than 18 → set to “Omitted or invalid”.
- LQ-05 (options a-b): if years of experience is larger than age (LQ-02) minus 18 → set to “Omitted”.
- LQ-05 (option c-d): if years of experience is larger than age (LQ-02) minus 10 → set to “Omitted”.
- LQ-05 (option a-d): if age (LQ-02) is missing (omitted) and years of experience is larger than 83 → set to “Omitted”.
- LQ-06: if value is greater than 120 → set to “Omitted or invalid”.
- LQ-22 (option a): if value is greater than 15 → set to “Omitted or invalid”.
- LQ-22 (options b-d): if value is greater than 200 → set to “Omitted or invalid”.
- LQ-23 (options a-c): if value is greater than 200 → set to “Omitted or invalid”.
- LQ-24: if value is greater than 200 → set to “Omitted or invalid”.
- LQ-25: if value is zero (0) in the questionnaire → set to “Omitted or invalid”.
- LQ-27 (options a-h): each item should be less than or equal to the value indicated in LQ-25.
- LQ-27: If LQ-25 is missing or flagged → use a threshold of 300 for each item.
- SQ-02: if value is less than 18 → set to “Omitted or invalid”.
- SQ-08 (option a-c): if years of experience is larger than age (SQ-02) minus 10 → set to “Omitted”.
- SQ-08 (options a-c): if age (SQ-02) is missing (omitted) and years of experience is larger than 83 → set to “Omitted”.
- SQ-10: implausible values were reviewed and corrected in consultation with countries due to their influence on weighting.
- SQ-27: if value is greater than 120 → set to “Omitted or invalid”.
- SQ-34 (options a–g): if value is greater than 500 → set to “Omitted or invalid”.
- SQ-35: if enrolment is zero (0) or greater than 300 → set to “Omitted or invalid”.
- SQ-36 (options a–e):
  - Keep cases only if each variable is less than or equal to SQ-35.
  - If SQ-35 is missing, then SQ-36a-e should be set to “Omitted” when larger than 300.
- SQ-37 (options a–g):
  - Each item should be less than or equal to the value indicated in SQ-35.
  - If SQ-35 is missing or flagged → use a threshold of 300 for each item.

### **8.4.5. Coding of missing data**

In the online mode, the assignment of missing values was automatically determined by the instrument design and respondents’ actions. During manual data capture using IEA DME at the national centres, data-entry staff could assign either valid values or missing data codes. Later, the ISC applied additional missing values during processing to support analysis and to reflect distinct types of non-response. A response to a question can be missing for several reasons, and TALIS 2024 distinguishes between four types of missing codes, each treated differently during processing (length-dependent Statistical Package for the Social Sciences [SPSS] and tagged R missing codes stated in parentheses):

- “Not administered” (“8”, “98”, “998”, etc. / NA[a]): Assigned when a question was not presented to the respondent and one of the following instances applied:
  - Empty questionnaire: If the returned questionnaire is empty, all variables referring to that instrument are coded as “Not administered” (unit non-response).

- Questions or parts not administered: A participating country/territory may have chosen not to administer a certain question or question part in their national questionnaire.
- Questions not administered due to questionnaire design: In the TALIS core survey, each teacher received one of three forms with subset of questions each. In TALIS Starting Strong, the combined questionnaires did not present all questions from both the leader and staff questionnaires.
- Translation or other data collection errors.
- “Omitted or invalid” (“9” / NA[m]): Used when the question was administered, but one of the following instances occurred:
  - Non-response: The question was administered but no response was provided.
  - Uninterpretable/invalid: The respondent selected more than the expected number of checkboxes (or marks in the paper administration) or gave an otherwise uninterpretable or invalid response.
- “Logically not applicable” (“6” / NA[(b)]: Assigned during processing when a respondent’s earlier response to a filter question rendered one or more dependent questions not applicable.
- “Not reached” (“7” / NA[r]): Used exclusively for GPK items in the TKS dataset.<sup>4</sup> Indicates that the respondent stopped answering before reaching the end. The last valid answer in the instrument was identified, first omitted response after this last answer was coded as “Omitted or invalid”, and all subsequent variables were coded as “Not reached”. Thus, “Not reached” values are exclusively located towards the end of the GPK instrument.

These distinctions ensure that distinct types of missing data are properly identified and consistently managed during processing, subsequent analyses and reporting.

## 8.5. Interim data products

Building the TALIS international database was an iterative process during which the ISC provided the OECD Secretariat and national centres with updated versions of data files whenever a major step in data processing was completed. This process aimed to ensure that countries and territories had a chance to review their data and conduct additional plausibility and statistical checks to validate the data. The data products that the ISC released included data files for the respective component and populations as well as data summaries. Given the role of the OECD Secretariat and countries/territories as data controllers, and the ISC as the primary data processor, all interim data were made available to the OECD Secretariat in full and without and suppressions, whereas each participating country/territory received only its own data.

Data releases were versioned and included the following major iterations, with a focus on the TALIS core survey:

- Following the respective end of data collection in each country or territory, the ISC released a first data version (v1.0) of unweighted and uncleaned data, except for the ID and linkage cleaning described above, to its sampling team for weighting in a staggered fashion from May to about September 2024. Where necessary for the purpose of non-response bias analyses, certain countries and territories also received their own data to facilitate cross-checking with administrative data or known control totals.
- The second major data version (v2.0) was weighted and cleaned to the extent possible and responses from national centres were available. It was released to the OECD Secretariat and countries and territories at the end of November 2024. At that time, almost all of the known identification, linkage and content issues in these data had been identified and resolved. Estimation



weights and variables facilitating variance estimation were also included. To protect respondents' identity, the ISC scrambled the original respondent IDs used in the field. These data were also used to begin production on the draft tables for the international reports. Importantly, NPMs were asked to review all data carefully and complete and submit a data sign-off form, a new step quality assurance step in TALIS 2024 to reduce the number of subsequent corrections, an observation made in 2018 and before, which complicated the report production at advanced stages.

- The third major data version (v3.0) was prepared and released in April 2025 following the scaling work and the inclusion of preliminary simple indices and other derived variables to be used to break-down reporting tables in the international report drafts as well as in relation to further limit the risk of re-identification by collapsing detailed count and other types information to coarsened grouped equivalents. An update of this database (v3.1) was shared with the OECD and participating countries/territories in July of 2025, concluding all data editing and correction, following the counties/territories review of the first draft of the reporting tables and chapters. Despite the earlier requirement to review all data comprehensively, this chapter and table review led to the identification of a sizeable number of issues in the data, for example erroneous mappings between national and international levels of education, which were not detected earlier. Version 3.1 also included the full set of derived variables, which were developed further in light of reporting needs and re-identification risk assessments at the international and national levels.

Between these three major versions, minor versions (e.g. Data version 2.1) were shared with countries and territories as well as the OECD, reflecting important per-country/territory updates that were deemed too substantial to only be reflected in the next major version.

The periods above relate to the largest survey component in TALIS 2024, namely the TALIS core survey. The periods for TALIS Starting Strong generally trailed those of the core survey by two to six weeks depending on the end of data collection, complexity and later reporting of the early childhood data in December 2025. The timeline for the TKS component generally followed the timeline for the core survey through major Version 2 but assembly of the complete draft database only occurred in June 2025, so about two to three months later than the TALIS core survey, given the additional steps required for the analysis and description of the GPK scale. The assembly of the TKS dataset was also less urgent, given that the initial report on the TKS and the associated dataset was planned for release in the first quarter of 2026, a few months after public release of data and report on the TALIS core survey.

All interim data products were accompanied by documentation detailing the data cleaning, national adaptation mappings, duplicate cases, weighting and descriptive statistics. The latter contained weighted as well as unweighted univariate statistics and frequencies for all questionnaire variables for each participating country/territory. For categorical variables, which represent most variables in TALIS, the percentages of respondents choosing each of the response options were displayed. For numeric or count variables, various descriptive measures were reported. These included the minimum, the maximum, the mean, the standard deviation, the median, the mode, percentiles and quartiles. For both types of variables, the percentages of missing information due to respondents omitting or not reaching a particular question were reported. These summaries were used for a more in-depth review of the data at the international and national levels in terms of plausibility, unexpected response patterns, suspicious profiles and so on.

## 8.6. Building the restricted and public-use international databases

For the international database (IDB), comprising data from more all countries and territories, data cleaning at the ISC ensured that the information coded in each variable was, in fact, internationally comparable, that national adaptations were reflected appropriately in all variables concerned (or data suppressed as a consequence of item and data adjudication), and that all records could be successfully linked across the two levels.



The process of building each IDB complied with the OECD's rules for the processing and transfer of personal data and, where relevant, with rules stipulated by national or regional legislation for the protection of personal data (e.g. the European Union General Data Protection Regulation).

The IDBs were produced in two different configurations serving two different audiences.

- The restricted-use file/database (RUF) was prepared for use by the participating countries and territories under confidentiality and embargo. This version of the database was comprehensive and only excluded variables used during sampling, collection and processing that carried no analytical value beyond the originating country/territory. It was made available in draft and final form, corresponding to data versions 3.0 and 3.1 described above.
- The public-use file/database (PUF) was prepared for use by the general public. Suppressions and coarsening of information were implemented to minimise the risk of re-identifying the original respondents and to comply with national laws and regulation on personal data protection, as well as with the OECD data protection rules. This database was produced as a single, final database to coincide with the launch of the respective international reports, noting that the first version in October 2025 excluded materials related to environmental and sustainability education. A second version was produced for release in due time including the questions and variables still under embargo in the first.

For the sake of completeness, all interim products included records for all sampled units (schools/settings or teachers/staff), even if the corresponding questionnaire was not returned or returned empty. In contrast, the international databases only included records that satisfied the participation standards. Records from units that either did not participate or did not pass adjudication for other reasons (e.g. because within-school/setting participation was insufficient) were removed. The adjudication process further determined a rating that identified which countries or territories were considered fit for comparative reporting. The adjudication rating was reflected in a new variable for TALIS 2024, namely ADJRT24.

To protect the respondents' identity and reduce the risk of re-identification, certain disclosure avoidance measures were applied: i) consistently for all participating countries/territories; and ii) in specific national datasets upon request by the national centres. The scope and details of these measures were further informed by assessments of the risk of re-identification implemented by the OECD Secretariat separately for the TALIS core survey and TALIS Starting Strong.

The eventual measures applied to both the RUF and PUF configurations of the international databases involved the following:

- The school (IDSCHOOL) and teacher (IDTEACH) IDs for the TALIS core survey, as well as staff (IDSTAFF) and early childhood and care setting (IDSETTING) IDs for TALIS Starting Strong were randomly scrambled. These scrambled and sequentially assigned IDs no longer matched those used during data collection; however, the structural link between levels was maintained. Matching tables were created for each participating country/territory and made available only to authorised individuals within that participating country/territory, yet not the OECD Secretariat.
- Variables used purely for the stratification of samples, that is, birth year (ITBIRTHY) and gender (GENDER) were removed. Only age and gender as collected in the questionnaires were retained.
- Variables used purely for stratification of schools or settings, i.e. IDSTRATE and IDSTRATI, were removed to prevent re-identification of geographical or organisational groups. Stratum information is mostly of interest for national-level analysis and was thus available to the concerned country/territory yet not others.
- Replication zone and unit variables (BRRSZONE, BRRSREP, BRRTZONE and BRRTREP) were dropped because they could enable indirect re-identification of units.
- For the TALIS core survey and TKS, the information used in the calculation of final sample and replicate weights (for the school level: WGTFAC1 and WGTADJ1C; for the teacher level:

WGTFAC1, WGTFAC2T, WGTADJ1T, WGTADJ2T and WGTADJ3T) was removed because it could allow identification of stratification cells. In TALIS Starting Strong, the variables excluded were similar (for the setting level: WGTFAC1 and WGTADJ1L; for the staff level: WGTFAC1, WGTADJ1S, WGTFAC2S, WGTADJ2S and WGTADJ3S).

- In the case of the TALIS core survey, specific interim variables were excluded to ensure consistency and analytical clarity. These included a set of language-related variables (TT4G29A-G), as well as the original responses to a question on teachers' policy recommendation (TT4G81) and its resolved counterpart (TT4G81\_R). Additionally, the English version variable capturing teachers' single most important recommendation to stakeholders (T4TPOLREC) was excluded to address concerns related to sensitivity.
- Finally, the set of quality control questions were excluded from the teacher data in the TALIS core survey and TKS as well as staff data in TALIS Starting Strong (TTJ4G01, TTJ4G02, TTJ4G03, TTJ4G04, TTJ4G05A, TTJ4G05B, TTJ4G05C, TTJ4G05D, TTJ4G06A, TTJ4G06B, TTJ4G06C, TTJ4G06D, TTJ4G06E and TTJ4G06F).

The draft RUF for the core survey, which included data from all participating countries/territories, was made available to all authorised individuals in April 2025. This was done following the agreement to the general data sharing policy at the 14th TALIS Governing Board meeting in February 2025, the provision of information to participating countries/territories' NPMs on the planned configuration of the RUF database, and authorisation from the OECD Secretariat as the data controller. The equivalent draft RUF for TALIS Starting Strong was made available to participating national centres in May 2025. These releases enabled participating countries and territories to replicate all results presented in the draft chapters of the international reports and were further used in a confidential international analysis workshop that the ISC held in Hamburg, Germany, in May 2025. Only accredited national centre members, i.e. individuals who were nominated in the corresponding confidentiality agreement with the OECD Secretariat, had access to the database and workshop.

The final RUF was shared with countries/territories under the same embargo and confidentiality rules in July 2025. It included all variables deemed to have analytical utility for international comparisons. The corresponding database for TALIS Starting Strong was released to national centres in July 2025 and the database for the TKS in October 2025.

The final public-use database (PUF) for the TALIS core survey (excluding variables related to environmental and sustainability education) was scheduled for release in October 2025, December 2025 for TALIS Starting Strong, March 2026 for the TKS, and 2027 for the full PUF (including variables related to environmental and sustainability education).

Each PUF included all adjudicated countries/territories and all cases, unless withdrawn. To manage the risk of re-identification, the PUF will contain fewer variables than the RUF, with suppressed variables often replaced by a less detailed grouped alternative. This limitation of variable inclusion aimed to ensure confidentiality while supporting a wide range of analytical uses.

The full list of suppressions relative to the original questionnaires as well as additional guidance on the use and limitations of data use were documented in the user guide to the TALIS 2024 international databases (OECD, forthcoming<sup>[1]</sup>).

## References

- OECD (2019), *TALIS 2018 Technical Report*, OECD Publishing, Paris,  
[http://www.oecd.org/education/talis/TALIS\\_2018\\_Technical\\_Report.pdf](http://www.oecd.org/education/talis/TALIS_2018_Technical_Report.pdf).

[2]

OECD (2019), *TALIS Starting Strong 2018 Technical Report*, OECD Publishing, Paris, [3]  
<https://www.oecd.org/content/dam/oecd/en/publications/reports/2019/01/talis-starting-strong-2018-technical-report/TALIS-Starting-Strong-2018-Technical-Report.pdf>.

OECD (forthcoming), *Teaching and Learning International Survey (TALIS) 2024 User Guide*, [1]  
 OECD Publishing, Paris.

## Notes

<sup>1</sup> TALIS 2018 and previous cycles, as well as TALIS Starting Strong 2018 used an additional set of rules, which applied to questions with more than two items and response options “Yes” and “No” and similarly “Check-all-that-apply” questions for which multiple check boxes could be selected. Occasionally, respondents marked just the “Yes” boxes but left the “No” boxes unchecked, resulting in omitted values. In earlier cycles, it was assumed that any unmarked boxes meant “No/unchecked” in instances where a combination of “Yes” and “Omitted” responses was found, and the corresponding values were thus changed to “No”. For TALIS 2024, the TALIS Technical Advisory Group recommended a clear rationale to treat “lazy omissions” and intentional “No” selections in the same way. Such rationale cannot be established from the data, and this set of cleaning rules was thus discontinued. See OECD (2019<sub>[2]</sub>) for details for the TALIS core survey and OECD (2019<sub>[3]</sub>) for TALIS Starting Strong.

<sup>2</sup> In TALIS 2018 and previous cycles listed age or gender was used to impute omitted values in the questionnaire.

<sup>3</sup> Numbering from item PQ-30 onwards refers specifically to the ISCED level 1 principal questionnaire, which includes one additional question. In the ISCED levels 2 and 3 questionnaires, the numbering of corresponding questions differs from that point onward.

<sup>4</sup> As a departure from previous cycles, the “Not reached” missing code is no longer used for any instrument other than the GPK component of the TKS. See OECD (2019<sub>[2]</sub>) and (2019<sub>[3]</sub>) for details.

## **9 Estimation weights, participation rates and sampling error**

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This chapter covers three important aspects of the quality of the OECD Teaching and Learning International Survey (TALIS) 2024 outcomes. The first is the weighting of the data to produce unbiased estimates. The weights need to reflect the sampling design and correct for unequal selection probabilities. Descriptions are provided of how each component of the final estimation weights was defined and how those components were assembled into the final estimation weights. The second aspect, participation rates, is detailed as a significant factor affecting data quality. The third and final aspect described is balanced repeated replication, the method chosen for this survey to achieve unbiased estimates of the sampling error.

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## 9.1. Overview

This chapter covers three important aspects of the quality of the OECD Teaching and Learning International Survey (TALIS) 2024 outcomes: the weighting of the data to correct for unequal selection probabilities and to adjust for non-response to produce unbiased estimates; participation rates; and the estimation of sampling error.

Although the international sampling design was prepared as a self-weighting sampling plan of teachers/staff members (whereby each teacher/staff member ultimately would have had the same final estimation weight), the actual conditions in the field, non-response at school/early childhood education and care (ECEC) setting and teacher/ECEC staff level, and the co-ordination of multiple samples made it impossible to fulfil this ideal plan. In the end, in most participating countries/territories, the national sampling plan was established as a stratified multi-stage probability sampling plan with unequal selection probabilities.

The following sections of this chapter detail how each component of the final estimation weight was defined and how these components were assembled into the final estimation weight. Annex F provides the resulting participation rates for each participating country/territory, module (International Standard Classification of Education [ISCED] levels 1, 2, 3 and 02, children under the age of three [U3], Teacher Knowledge Survey [TKS]) and population (teachers, schools/principals, staff, settings/leaders).

Because of the unequal weights and the complex structure of the samples, sampling error must be estimated by accounting for the survey's design and weights. Failure to do this can translate into severely biased estimates of sampling error.

Correctly estimating sampling error for complex samples is often a daunting task but simple and approximately unbiased methods are available. TALIS 2024, like its previous cycles, opted for balanced repeated replication (BRR) not only because of its statistical properties (consistency, asymptotic unbiasedness) and its portability (one formula fits all types of parameter estimates) but also because it is comparatively easy to compute.

The last section of this chapter explains how the variables ("replicates") needed for conducting this method were created and how the BRR estimates of sampling error, as displayed in the various reports, were computed. These estimates of the sampling error are another key element of the statistical quality of the TALIS survey outcomes.

A more detailed description of the survey design and its implementation can be found in Chapter 5 of this report.

## 9.2. Estimation weights

The statistics produced for TALIS 2024 were derived from data obtained through samples of schools/settings, principals/leaders and teachers/staff. To achieve meaningful statistics for a participating country/territory, those statistics needed to reflect the whole population from which they were sampled and not merely the sample used to collect them. The process of inferring characteristics of the survey population from sample data is called estimation.

The estimation weight, or final weight, is the device that allows the production of country-level estimates from the observed sample data. The estimation weight indicates the number of population units that a sampled unit (e.g. a survey respondent) represents. The final weight is the combination of many factors reflecting the selection probabilities during the various sampling stages and including a correction for non-response obtained at each stage. Other factors may also come into play as dictated by special

conditions to maintain unbiasedness of the estimates (e.g. adjustment for teachers/staff working in more than one school/setting).

Because TALIS 2024 consisted of multiple modules, estimation weights had to be computed independently for each module. This requirement held true even if the samples were co-ordinated across the modules.

Generally, final weights are the product of a design, or base weight, and of one or multiple adjustment factors; the former is the inverse of the selection probability, the latter compensates for random non-response that could, if not accounted for, induce bias in the estimates. These design weights and adjustment factors are specific to each stage of the sample design and to each explicit stratum. Because the participating countries/territories adapted the general sample design of TALIS 2024 to their own conditions, the estimation weights had to conform to these national adaptations.

The following are the conventional notations used in this chapter. The letters  $h$ ,  $i$  and  $j$  are used as subscripts, lower-case letters  $d$ ,  $k$ ,  $l$ ,  $m$ ,  $n$ ,  $q$ ,  $r$  and  $t$  refer to the sample and upper-case letters  $H$ ,  $L$ ,  $M$  and  $N$  refer to the population (see also Table 9.1).

- Each participating country/territory had  $H$  explicit strata, and the index  $h = 1, \dots, H$  points to the explicit stratum.
- In each explicit stratum, a sample of  $n_h$  schools/settings was selected from the  $N_h$  schools/settings forming stratum  $h$ . The index  $i = 1, \dots, n_h$  therefore points to the  $i^{\text{th}}$  sampled school/setting in explicit stratum  $h$ .
- Each school/setting  $i = 1, \dots, n_h$  within the explicit stratum  $h$  had a measure of size (MOS) noted as  $M_{hi}$ ; the sum of the individual MOS is noted as  $M_h$ . Ideally, this MOS comprised the expected number of eligible teachers/staff members in each school/setting, but if this information was unavailable, the MOS could be another size measure such as number of students/children. The number of teachers/staff members (not counting the leader) per school/setting at the time of teacher/staff sampling is given by  $L_{hi}$ .
- In each responding school/setting, a sample of  $m_{hi}$  teachers/staff was selected from the listing of  $L_{hi}$  teachers/staff. Leaders with staff duties (including persons who work alone in a setting) were added to the staff sample.

**Table 9.1. Conventional notations used in this chapter**

| Unit                            | Indices | Units sampled | Participating units | Eligible non-participating units | Ineligible units | Units in population |
|---------------------------------|---------|---------------|---------------------|----------------------------------|------------------|---------------------|
| Explicit stratum                | $h$     |               |                     |                                  |                  | $H$                 |
| Schools/settings                | $i$     | $n$           | $r$                 |                                  | $d$              | $N$                 |
| Measure of size                 |         |               |                     |                                  |                  | $M$                 |
| Teachers/staff (without leader) | $j$     | $m$           | $t$                 | $q$                              |                  | $L$                 |
| Leaders with staff duties       |         |               | $t^l$               | $q^l$                            |                  |                     |

### 9.3. Weights for school/setting and principal/leader data

#### 9.3.1. Design weight for school/setting and principal/leader data

The first sampling stage in TALIS 2024 consisted of selecting the school/setting samples. In most participating countries/territories, this sample followed a systematic random sampling scheme with probability proportional to size (PPS). In participating countries/territories where most schools/settings were small or no MOS was available, systematic simple random samples were selected instead, which

meant each school/setting in an explicit stratum had the same probability of being selected. Consequently, a school/setting base weight was needed to represent this first sampling stage. If all schools/settings were selected in an explicit stratum of a participating country/territory (i.e. a census was conducted), the school/setting base weight was set to 1 for that explicit stratum.

Using the notation given above, for each school/setting  $i = 1, \dots, n_h$  and each explicit stratum  $h = 1, \dots, H$ , the school/setting base weight was given by:

$$WGTFAC1_{hi} = \frac{M_h}{n_h \times M_{hi}}$$

In countries/territories with a three-stage sampling design (see Annex D for information about the samples of individual countries/territories), the weight component corresponding to the first stage was incorporated into the school/setting base weight by multiplying the inverse of the first-stage selection probabilities with the original school/setting base weight.

### 9.3.2. Weight adjustment for school/setting or principal/leader non-response

Despite all efforts to secure the participation of all selected schools/settings, some were unable or unwilling to participate.

The school/setting non-response adjustment factor was computed separately for the teacher/staff and the principal/leader populations. A school was treated as non-responding with regard to the teacher population if less than 50% of the selected teachers participated. For the TALIS Starting Strong component (ISCED level 02 and U3), 33% of the selected members of staff had to participate to count the setting as responding with regard to the staff population. A school/setting was treated as non-responding with regard to the principal/leader population if the principal/leader did not return a completed questionnaire. Hence, a school/setting could be treated as participating for the teacher/staff population and non-participating for the principal/leader population, or vice versa.

Assuming non-participation occurred at random, i.e. there was no systematic difference between respondents and non-respondents within explicit strata, the weights of participating schools/settings were adjusted to also represent non-participating schools/settings.

For each explicit stratum  $h = 1, \dots, H$ , if  $r_h$  schools/settings out of the  $n_h$  selected schools/settings participated in TALIS 2024, and if  $d_h$  schools/settings were found to be closed or out of scope, the non-response adjustment factor was:

for schools/principals in ISCED levels 1, 2 and 3:

$$WGTADJ1C_h = \frac{n_h - d_h}{r_h}$$

for settings/leaders in ISCED level 02 and U3:

$$WGTADJ1L_h = \frac{n_h - d_h}{r_h}$$

### 9.3.3. Final (estimation) school/setting weight for school/setting and principal/leader data

The school/setting estimation weight is the product of the school/setting base weight and the school/setting non-response adjustment factor. It was used to estimate the school/-setting-related parameters, with the information taken from the principal/leader questionnaires.

The final school/setting weight (school/setting estimation weight) for each participating school/setting  $i = 1, \dots, r_h$  and each explicit stratum  $h = 1, \dots, H$  was given as:



for schools/principals in ISCED levels 1, 2 and 3:

$$SCHWGTC_{hi} = WGT FAC1_{hi} \times WGTADJ1C_h = \frac{M_h}{n_h \times M_{hi}} \times \frac{n_h - d_h}{r_h}$$

for settings/leaders in ISCED level 02 and U3:

$$LEADERWGT_{hi} = WGT FAC1_{hi} \times WGTADJ1L_h = \frac{M_h}{n_h \times M_{hi}} \times \frac{n_h - d_h}{r_h}$$

### 9.3.4. Interpreting the principal/leader weights

For the principal/leader weights, it is important to consider that the approach taken by TALIS does not reflect situations where multiple principals/leaders work in the same school/setting, or where one principal/leader works in multiple schools/settings. This approach prioritises statements that are made referring to schools/settings. As a consequence, statement formulations like “The principals/leaders of 20% of schools/settings report that...” are recommended.

For any statements about schools/settings or principals/leaders, only the weights  $SCHWGTC_{hi}$  or  $LEADERWGT_{hi}$  in the principal/leader datasets must be used. The use of weighting variables from the teacher/staff datasets is incorrect.

## 9.4. Weights for teacher/staff data

### 9.4.1. Design weight for the school/setting level of teacher/staff data

The design weight for the school/setting level of the teacher/staff population is identical to the equivalent school/setting weights.

$$WGT FAC1_{hi} = \frac{M_h}{n_h \times M_{hi}}$$

### 9.4.2. Weight adjustment for non-participating schools/settings

In the case of teacher data, a school was considered a participating school if at least 50% of the selected teachers provided responses in their questionnaires; response to one single item was sufficient to be counted. For the TALIS Starting Strong component (ISCED level 02 and U3), 33% of the selected staff members had to participate to consider the setting as participating. Note that schools/settings for which principal/leader data were available could be deemed participating in the principal/leader survey but non-participating for the teacher/staff population, and vice versa. An adjustment factor to the school/setting design weight was thus necessary and it was possible that it would differ from the adjustment factor computed for the school/setting dataset.

For each explicit stratum  $h = 1, \dots, H$ , if  $r_h$  schools/settings participated out of the  $n_h$  selected schools/settings, and if  $d_h$  schools/settings were closed or out of scope, the non-response adjustment factor was:

for teachers in ISCED levels 1, 2 and 3:

$$WGTADJ1T_h = \frac{n_h - d_h}{r_h}$$

for staff in ISCED level 02 and U3:

$$WGTADJ1S_h = \frac{n_h - d_h}{r_h}$$

### 9.4.3. Design weight for teacher/staff data

In each participating school/setting, a systematic random sample of teachers/staff was selected with equal probabilities from all teachers/staff who were not the leader. All leaders with staff duties had a staff design weight of 1 because they had been selected with certainty in every setting.

For each selected teacher/staff member  $j = 1, \dots, m_{hi}$  of school/setting  $i = 1, \dots, n_h$  in explicit stratum  $h = 1, \dots, H$ , the teacher/staff base weight was:

for teachers in ISCED levels 1, 2 and 3:

$$WGTFAC2T_{hi} = \frac{L_{hi}}{m_{hi}}$$

for staff members who were not the leader in ISCED level 02 and U3:

$$WGTFAC2S_{hi} = \frac{L_{hi}}{m_{hi}}$$

for leaders with staff duties in ISCED level 02 and U3:

$$WGTFAC2S = 1$$

### 9.4.4. Weight adjustment for non-participating teachers/staff

Unfortunately, because not all selected teachers/staff members were able or willing to participate in TALIS, the non-participating teachers/staff members needed to be represented by the participating ones. Under the assumption of “Missing at random” within an explicit stratum, representation was achieved by applying the teacher/staff non-response adjustment factor.

Each participating school/setting  $i = 1, \dots, n_h$  of each explicit stratum  $h = 1, \dots, H$  had three kinds of sampled teachers/staff: those who responded (noted  $t_{hi}$ ), those who left the school permanently after the sample had been selected or were found to be out of scope, and those who did not respond but who were still at the selected school/setting (noted  $q_{hi}$ ). Here, the teacher/staff non-response adjustment factor was:

for teachers in ISCED levels 1, 2 and 3:

$$WGTADJ2T_{hi} = \frac{t_{hi} + q_{hi}}{t_{hi}}$$

for staff members who were not the leader in ISCED level 02 and U3:

$$WGTADJ2S_{hi} = \frac{t_{hi} + q_{hi}}{t_{hi}}$$

Non-responding leaders with staff duties were adjusted differently, assuming that leaders with staff duties could not be adjusted by increasing the staff weights from the same setting because their answers might have been systematically different due to their role within the setting. Therefore, other leaders with staff duties from the same explicit stratum represented non-participating leaders with staff duties:

for leaders with staff duties in ISCED level 02 and U3:

$$WGTADJ2S_h = \frac{t_h^l + q_h^l}{t_h^l}$$

### 9.4.5. Teacher/staff multiplicity adjustment factor

Some teachers/staff members were working in more than one school/setting. Because the teacher/staff samples were independent from one school/setting to the next, selecting the same teacher/staff members more than once was possible. An adjustment was needed to account for the number of schools/settings in

which a given teacher/staff member worked in order to avoid overestimation of teacher counts. In TALIS, this information came from the questionnaires teachers/staff members completed. The adjustment factor was the reciprocal of the number of schools/settings in which the teachers/staff members worked.

For teachers/staff members who did not provide an answer in the questionnaire, or who provided answers that were considered as being out of the possible range by the national centre, it was assumed that they did not work in other schools/settings.

The teacher/staff multiplicity adjustment factor computed for each responding teacher/staff member  $j = 1, \dots, t_{hij}$  in each participating school/setting  $i = 1, \dots, r_h$  in explicit stratum  $h = 1, \dots, H$ , was:

for teachers in ISCED levels 1, 2 and 3:

$$WGTADJ3T_{hij} = \frac{1}{nb\_schools_{hij}}$$

with  $nb\_schools$  being the number of schools a teacher was teaching

for staff in ISCED level 02 and U3:

$$WGTADJ3S_{hij} = \frac{1}{nb\_settings_{hij}}$$

with  $nb\_settings$  being the number of settings in which a staff member was working.

#### 9.4.6. Final teacher/staff weight

The final teacher/staff weight (estimation weight) is the product of the school/setting design weight, the weight adjustment for school/setting non-response, the teacher/staff design weight, the weight adjustment for teacher/staff non-response and the teacher/staff multiplicity adjustment factor. All estimates referring to the teacher/staff population used the final teacher/staff weight.

The final teacher/staff weight computed for each participating teacher/staff  $j = 1, \dots, t_{hi}$  in each participating school/setting  $i = 1, \dots, r_h$  in explicit stratum  $h = 1, \dots, H$  was:

for teachers in ISCED levels 1, 2 and 3:

$$\begin{aligned} TCHWGT_{hij} &= WGT FAC1_{hi} \times WGTADJ1T_h \times WGT FAC2T_{hi} \times WGTADJ2T_{hi} \times WGTADJ3T_{hij} \\ &= \frac{M_h}{n_h \times M_{hi}} \times \frac{n_h - d_h}{r_h} \times \frac{L_{hi}}{m_{hi}} \times \frac{t_{hi} + q_{hi}}{t_{hi}} \times \frac{1}{nb\_schools_{hij}} \end{aligned}$$

for staff members who were not the leader in ISCED level 02 and U3:

$$\begin{aligned} STAFFWGT_{hij} &= WGT FAC1_{hi} \times WGTADJ1S_h \times WGT FAC2S_{hi} \times WGTADJ2S_{hi} \times WGTADJ3S_{hij} \\ &= \frac{M_h}{n_h \times M_{hi}} \times \frac{n_h - d_h}{r_h} \times \frac{L_{hi}}{m_{hi}} \times \frac{t_{hi} + q_{hi}}{t_{hi}} \times \frac{1}{nb\_settings_{hij}} \end{aligned}$$

for leaders with staff duties in ISCED level 02 and U3:

$$\begin{aligned} STAFFWGT_{hij} &= WGT FAC1_{hi} \times WGTADJ1S_h \times WGT FAC2S \times WGTADJ2S_h \times WGTADJ3S_{hij} \\ &= \frac{M_h}{n_h \times M_{hi}} \times \frac{n_h - d_h}{r_h} \times 1 \times \frac{t_h^l + q_h^l}{t_h^l} \times \frac{1}{nb\_settings_{hij}} \end{aligned}$$

#### 9.4.7. School/setting weights in the teacher/staff data

In the teacher/staff datasets, the school/setting weight is included as well. It is defined as:

$$SCHWGT_{hi} = WGT FAC1_{hi} \times WGTADJ1T_h$$

This weight has not been used for any analysis presented in the TALIS international reports. However, it may be useful for scholars using the TALIS public database for secondary analysis, specifically for multi-level analysis, where aggregates determine modelling variables at the school/setting level (Atasever, Huang and Rutkowski, 2025<sup>[1]</sup>; Mang et al., 2021<sup>[2]</sup>). It must be noted that this school/setting weight is different from the one in the school/setting dataset; it should therefore not be used to analyse data from the school/setting dataset.

Please note that multi-level analysis is not recommended for TALIS Starting Strong because smaller numbers of staff members were surveyed within settings.

## 9.5. Participation rates

The quality requirements for TALIS translated into participation rates (response rates) for schools/settings and for teachers/staff (tabulated in Chapter 10 for participating countries/territories). Reaching the required participation levels does not preclude some degree of error in the results but should reduce reliance on the “Missing at random” assumptions made for the non-response adjustments.

### 9.5.1. Participation rate for schools/settings and principals/leaders

TALIS considered schools/settings where the principal/leader returned a questionnaire to be “Participating” schools/settings for the purposes of the school/setting and principal/leader weights and database.

The unweighted school/setting participation rate was computed as:

$$\frac{\sum_{h=1}^H \sum_{i=1}^{r_h} 1}{\sum_{h=1}^H \sum_{i=1}^{n_h-d_h} 1} = \frac{\sum_{h=1}^H r_h}{\sum_{h=1}^H (n_h - d_h)}$$

where  $r_h$ ,  $n_h$  and  $d_h$  are as defined above. This formula represents the crude proportion of principals/leaders from which questionnaires were received.

The weighted school/setting participation rate was computed as:

for schools/principals in ISCED levels 1, 2 and 3:

$$\frac{\sum_{h=1}^H \sum_{i=1}^{r_h} WGT FAC1_{hi}}{\sum_{h=1}^H \sum_{i=1}^{r_h} SCHWGT C_{hi}}$$

for settings/leaders in ISCED level 02 and U3:

$$\frac{\sum_{h=1}^H \sum_{i=1}^{r_h} WGT FAC1_{hi}}{\sum_{h=1}^H \sum_{i=1}^{r_h} LEADERWGT_{hi}}$$

This formula represents the proportion of the population of schools/settings or principals/leaders accounted for by the participating schools/settings.

Both rates were computed once over the subset of participating schools/settings in the original selection (before replacement) and once over the complete set of participating schools/settings (after replacement). Although replacements could be called upon as substitutes for non-responding schools/settings, the countries/territories were encouraged to do all they could to obtain the participation of the schools/settings in the original sample. As the number of replacements increased, the sample would have lost its probabilistic features and become increasingly “purposive”, a situation with the potential to undermine the reliability, validity and interpretability of a country’s/territory’s results.

### 9.5.2. Participation rate for teachers/staff

#### *School/setting level*

TALIS considered schools/settings where at least 50% of selected teachers/at least 33% of selected staff members responded to the questionnaire to be “Participating” schools/settings for the purpose of the teacher/staff weights and database, regardless of their participation status on the school/setting database, that is, regardless of whether or not their principals/leaders returned their questionnaire. TALIS deemed schools/settings that failed to meet this threshold as “Non-participating”.

The unweighted participation rate for the school/setting level was computed as:

$$\frac{\sum_{h=1}^H \sum_{i=1}^{r_h} 1}{\sum_{h=1}^H \sum_{i=1}^{n_h-d_h} 1} = \frac{\sum_{h=1}^H r_h}{\sum_{h=1}^H (n_h - d_h)}$$

where  $r_h$ ,  $n_h$  and  $d_h$  are as defined above.

The weighted school/setting participation rate was computed as:

for schools in ISCED levels 1, 2 and 3:

$$\frac{\sum_{h=1}^H \sum_{i=1}^{r_h} WGT FAC1_{hi}}{\sum_{h=1}^H \sum_{i=1}^{r_h} WGT FAC1_{hi} \times WGT ADJ1T_h}$$

for settings in ISCED level 02 and U3:

$$\frac{\sum_{h=1}^H \sum_{i=1}^{r_h} WGT FAC1_{hi}}{\sum_{h=1}^H \sum_{i=1}^{r_h} WGT FAC1_{hi} \times WGT ADJ1T_h}$$

#### *Teacher/staff level*

Teacher/staff participation was calculated over all participating schools/settings, whether the schools/settings were in the original sample or used as a replacement.

The unweighted teacher/staff participation rate was defined as:

$$\frac{\sum_{h=1}^H \sum_{i=1}^{r_h} \sum_{j=1}^{t_{hi}} 1}{\sum_{h=1}^H \sum_{i=1}^{r_h} \sum_{j=1}^{t_{hi}+q_{hi}} 1} = \frac{\sum_{h=1}^H \sum_{i=1}^{r_h} t_{hi}}{\sum_{h=1}^H \sum_{i=1}^{r_h} t_{hi} + q_{hi}}$$

This formula gives the crude ratio of the number of responding teachers/staff in participating schools/settings with respect to the expected sample size from the participating schools/settings.

The weighted teacher/staff participation rate was:

$$\frac{\sum_{h=1}^H \sum_{i=1}^{r_h} \sum_{j=1}^{t_{hi}} WGT FAC1_{hi} \times WGT FAC2T_{hij} \times WGT ADJ3T_{hij}}{\sum_{h=1}^H \sum_{i=1}^{r_h} \sum_{j=1}^{t_{hi}} WGT FAC1_{hi} \times WGT FAC2T_{hij} \times WGT ADJ2T_{hi} \times WGT ADJ3T_{hij}}$$

This formula represents the proportion of teachers/staff in the population who would have participated in the assessment, given all schools/settings had participated.

#### *Overall teacher/staff participation rates*

The overall weighted and unweighted participation rates were the products of the respective participation rates at the school/setting level and the teacher/staff participation rates.

### 9.5.3. Reporting participation rates

Weighted and unweighted participation rates, with and without replacement schools, were produced for the school/setting and principal/leader data and for the teacher/staff data. The analytical results for each country/territory were annotated according to whether or not the response rate requirements were adequately met. The detailed participation rates are listed in Annex F.

## 9.6. Estimating sampling error with balanced repeated replication

Estimation of sampling error for surveys with complex sampling designs such as TALIS requires special attention. Both the survey design and the unequal weights are needed to obtain (approximately) unbiased estimates of sampling error. Neglecting these design features can lead to severe underestimation of the sampling error. While exact formulae exist in theory for stratified PPS sample designs, the required computations become practically impossible as soon as the number of primary units selected per stratum exceeds two.

Over the years, various statisticians have proposed approximate solutions for this problem. An important class of solutions is that of resampling or replication. The best-known examples of replication methods are interpenetrating subsamples (Mahalanobis), balanced half-samples or balanced repeated replication (McCarthy, Fay), the Jackknife (Quenouille, Tukey, Durbin, Frankel) and the Bootstrap (Efron). For reviews of these methods, see, for example, Lohr (1999<sup>[3]</sup>), Rust and Rao (1996<sup>[4]</sup>) or Wolter (2007<sup>[5]</sup>). Atasever, Meinck and Cortes (2025<sup>[6]</sup>) provided a comprehensive investigation and discussion of the advantages and disadvantages of the major replication methods used in international large-scale assessments and their variants, including the methods used for TALIS.

In a similar vein to what was done for the OECD Programme for International Student Assessment (PISA) since its inception (OECD, 2024<sup>[7]</sup>), TALIS adopted the balanced repeated replication (BRR) method for estimation of the sampling error of the population parameter estimates. BRR is a replication method suited to sample designs where exactly two primary sampling units (PSUs) are selected in each stratum, and the total of participating PSUs is a multiple of four.

The principle of BRR is as follows: each of the two PSUs can provide an unbiased estimate of any sample-observed parameter of interest of its stratum. If the sampling design comprises  $H$  strata, then  $2^H$  possible unbiased estimates of the parameter of interest are obtained by combining either PSU from each of the  $H$  strata. The sampling error of the estimate of the parameter of interest can directly be computed by comparing each of the  $2^H$  estimates with their mean, as is usually done in simple basic statistics. Even with moderate values of  $H$ , the number of unbiased estimates may be quite large (e.g.  $2^5 = 32$ ,  $2^{10} = 1\,024$ ,  $2^{20} = 1\,048\,576$ ). BRR provides a way to extract from the complete set of  $2^H$  possible replicates a much smaller subset that gives the same measure of sampling error as the full set.

### 9.6.1. Creating replicates for BRR

BRR was developed for sample designs that use only two PSUs per stratum. Clearly, none of the countries/territories participating in TALIS 2024 implemented this type of design. Fortunately, a superimposed “BRR-ready” sample plan could be used to approximate the implemented sample design. The participating schools/settings (of the original sample or the replacements), listed in the order in which they appeared on the sampling frame and sorted by stratification and size, were paired within explicit strata, and each pair was dubbed “pseudo stratum” or “zone”.

If the number of participating schools/settings in an explicit stratum was odd, a triplet was formed with the last three schools/settings. If the sample was a census, the schools/settings had the function of explicit strata, and the teachers/staff members within schools/settings were paired. In the very rare cases where

a school/setting had only one teacher/staff member, it was not possible to form either a pair or a triplet, and this teacher/staff member stayed alone in a zone. The pairs (or triplets) were then numbered sequentially from 1 to  $G$ , spanning the whole sample; within each pseudo stratum or zone, each school/setting was assigned a random pseudo-PSU number of 1 or 2 as depicted in Table 9.2.

**Table 9.2. Example of “BRR-ready” sample design and random assignment of pseudo-PSUs**

| Explicit stratum | School/setting identifier | Zone = pseudo stratum | Pseudo-PSU |
|------------------|---------------------------|-----------------------|------------|
| 1                | 1001                      | 1                     | 1          |
| 1                | 1002                      | 1                     | 2          |
| 1                | 1003                      | 2                     | 2          |
| 2                | 1004                      | 2                     | 1          |
| 2                | 1005                      | 3                     | 1          |
| 2                | 1006                      | 3                     | 2          |
| 3                | 1007                      | 3                     | 1          |
| ...              | ...                       | ...                   | ...        |
| H                | ...                       | G-1                   | 2          |
| H                | ...                       | G-1                   | 1          |
| H                | ...                       | G                     | 1          |
| H                | ...                       | G                     | 2          |

In BRR, to compute a replicate estimate of the parameter of interest, the weight of one of the two pseudo PSUs is dropped, and the weight of the remaining PSU is doubled. A special matrix (of order  $4t$ ) of +1s and -1s (the so-called Hadamard matrix) is used to indicate which PSU should be kept (+1) and which should be dropped (-1) from each pseudo stratum in BRR, a process associating the +1s with the PSUs numbered 1 and the -1s with the PSUs numbered 2. As an example, the Hadamard matrix of order 8 can be written as:

$$Hadamard_8 = \begin{pmatrix} +1 & +1 & +1 & -1 & +1 & -1 & -1 & -1 \\ -1 & +1 & +1 & +1 & -1 & +1 & -1 & -1 \\ -1 & -1 & +1 & +1 & +1 & -1 & +1 & -1 \\ +1 & -1 & -1 & +1 & +1 & +1 & -1 & -1 \\ -1 & +1 & -1 & -1 & +1 & +1 & +1 & -1 \\ +1 & -1 & +1 & -1 & -1 & +1 & +1 & -1 \\ +1 & +1 & -1 & -1 & -1 & -1 & +1 & -1 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \end{pmatrix}$$

In this matrix, each column is a BRR replicate, and each line is a pseudo stratum or zone. The matrix entry indicates which pseudo-PSU should be kept from each pseudo stratum to create the BRR replicate. The Hadamard matrix of order 8 translates into the pattern depicted in Table 9.3.

For TALIS 2024, and in keeping with what was done in the previous cycles of TALIS and PISA, a variation of the BRR developed by Fay (1989<sub>[8]</sub>) was implemented. Instead of completely dropping a PSU and doubling the weight of the other one, the final weight ( $TCHWGT_{hij}/STAFFWGT_{hij}$ ) of every teacher/staff member in the PSU indicated by the Hadamard matrix was multiplied by the replicate factor of 1.5 to get the replicate weight. Likewise, the final weight ( $TCHWGT_{hij}/STAFFWGT_{hij}$ ) of the teachers/staff in the remaining PSU was multiplied by the replicate factor of 0.5. This strategy removed the risk of completely deleting a subgroup within the replicate sample contributing to some subgroup estimates.

In cases where there was an odd number of PSUs in an explicit stratum, the last three PSUs constituted the last zone. For each replicate, as indicated by the Hadamard matrix, the weight of the selected unit was multiplied by 1.7071 if it was the single unit, and the weights of the remaining pair were multiplied by



0.6464. If the matrix indicated that the pair should be selected, the weights of the paired units were multiplied by 1.3536, and the weight of the single unit was multiplied by 0.2929. This strategy, developed by Judkins (Adams and Wu, 2003<sup>[9]</sup>), ensured that the sum of the factors was 3.

**Table 9.3. Example of which pseudo-PSU to select per zone**

| Zone | Replicate 1  | Replicate 2  | Replicate 3  | Replicate 4  | Replicate 5  | Replicate 6  | Replicate 7  | Replicate 8  |
|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1    | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 2 | Pseudo-PSU 1 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 2 |
| 2    | Pseudo-PSU 2 | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 2 | Pseudo-PSU 1 | Pseudo-PSU 2 | Pseudo-PSU 2 |
| 3    | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 2 | Pseudo-PSU 1 | Pseudo-PSU 2 |
| 4    | Pseudo-PSU 1 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 2 | Pseudo-PSU 2 |
| 5    | Pseudo-PSU 2 | Pseudo-PSU 1 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 2 |
| 6    | Pseudo-PSU 1 | Pseudo-PSU 2 | Pseudo-PSU 1 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 2 |
| 7    | Pseudo-PSU 1 | Pseudo-PSU 1 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 1 | Pseudo-PSU 2 |
| 8    | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 2 | Pseudo-PSU 2 |

The resulting factors based on the Hadamard matrix of order 8 looked like the pattern in Table 9.4 for the first seven schools/settings of the example above.

**Table 9.4. Example of BRR factors**

| School/setting identifier | Zone | Pseudo-PSU | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Factor 6 | Factor 7 | Factor 8 |
|---------------------------|------|------------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1001                      | 1    | 1          | 1.5      | 1.5      | 1.5      | 0.5      | 1.5      | 0.5      | 0.5      | 0.5      |
| 1002                      | 1    | 2          | 0.5      | 0.5      | 0.5      | 1.5      | 0.5      | 1.5      | 1.5      | 1.5      |
| 1003                      | 2    | 2          | 1.5      | 0.5      | 0.5      | 0.5      | 1.5      | 0.5      | 1.5      | 1.5      |
| 1004                      | 2    | 1          | 0.5      | 1.5      | 1.5      | 1.5      | 0.5      | 1.5      | 0.5      | 0.5      |
| 1005                      | 3    | 1          | 0.6464   | 0.6464   | 1.3536   | 1.3536   | 1.3536   | 0.6464   | 1.3536   | 0.6464   |
| 1006                      | 3    | 2          | 1.7071   | 1.7071   | 0.2929   | 0.2929   | 0.2929   | 1.7071   | 0.2929   | 1.7071   |
| 1007                      | 3    | 1          | 0.6464   | 0.6464   | 1.3536   | 1.3536   | 1.3536   | 0.6464   | 1.3536   | 0.6464   |

Because the nominal sample size for ISCED levels 1, 2 and 3 was  $n = 200$  schools, a maximum of  $G = 100$  zones or pseudo strata were created for each participating country/territory, and a series of  $G = 100$  BRR replicate weights were also computed and stored. For ISCED level 02 and U3, with  $n = 180$  settings, a maximum of  $G = 92$  zones were created and  $G = 92$  BRR replicate weights were calculated. The creation of BRR weights was applied to all participating countries/territories, regardless of the sample size and of the method of sample selection.

### 9.6.2. Estimating the sampling error

Let  $\theta$  be the population parameter of interest. Let  $\hat{\theta}$  be the full sample estimate for  $\theta$  obtained by using the final weight, and let  $\hat{\theta}_g$ ,  $g = 1, \dots, G$ , be the  $G$  BRR replicate estimates (i.e. 92 or 100) of the same parameter of interest obtained by using the BRR weights described earlier. Then, with  $k$  set to equal 0.5, Fay's BRR estimate of the sampling variance and sampling error of  $\hat{\theta}$  are, respectively, given as:

$$\hat{V}_{FAY}(\hat{\theta}) = \frac{1}{G(1-k)^2} \sum_{g=1}^G (\hat{\theta}_g - \hat{\theta})^2 = \frac{4}{G} \sum_{g=1}^G (\hat{\theta}_g - \hat{\theta})^2$$

$$se_{FAY}(\hat{\theta}) = \sqrt{\hat{V}_{FAY}(\hat{\theta})}$$

### 9.6.3. Using sampling error when comparing estimates

When estimates (either variables or groups within a country/territory) are compared across two countries/territories, or when a country/territory value is compared to the international average, the comparison must be scaled through use of the appropriate estimate of sampling error.

The standard error for the difference of two estimates from one country/territory, say  $\theta_1$  and  $\theta_2$ , is given as:

$$se(\hat{\theta}_1 - \hat{\theta}_2) = \sqrt{\hat{V}_{FAY}(\hat{\theta}_1) + \hat{V}_{FAY}(\hat{\theta}_2) - 2Cov(\hat{\theta}_1, \hat{\theta}_2)}$$

The standard error for the difference of the estimates for two countries/territories, or for the difference of the estimates of two TALIS cycles, say  $\theta_A$  and  $\theta_D$ , is:

$$se(\hat{\theta}_A - \hat{\theta}_D) = \sqrt{\hat{V}_{FAY}(\hat{\theta}_A) + \hat{V}_{FAY}(\hat{\theta}_D)}$$

The standard error for the difference of an estimate for a given country/territory, say  $\theta_A$  and the international average  $\hat{\theta}$ , is:

$$se(\hat{\theta}_A - \hat{\theta}) = \sqrt{\frac{(C^2 - 2C)\hat{V}_{FAY}(\hat{\theta}_A) + \sum_{k=1}^C \hat{V}_{FAY}(\hat{\theta}_k)}{C^2}}$$

where  $\hat{\theta} = \sum \hat{\theta}_k / C$ ,  $C$  is the number of countries/territories contributing to the mean  $\hat{\theta}$ , and  $\hat{\theta}_A$  is the estimate for country/territory  $A$ .

Comparisons of subpopulations within a country/territory should be done while accounting for sample dependency. Specific software, such as, for example, the International Association for the Evaluation of Educational Achievement (IEA) International Database Analyzer (IDB Analyzer) (2025<sup>[10]</sup>), accounts automatically for covariance between units of the groups to be compared. Another solution would be to apply a regression using a dummy variable, as illustrated in the following example. Suppose that the difference between male and female teachers for some characteristic (e.g. hours of class management per week) is of interest. A dummy variable  $Gender = 0$  if male,  $Gender = 1$  if female can be set. A regression model can then be written as  $Score = a_0 + a_1 Gender$ . Clearly, if  $Gender = 0$ , then  $Score_{male} = a_0$ . Likewise, by setting  $Gender = 1$ ,  $Score_{female} = a_0 + a_1$  is obtained. Design-based estimation of the regression parameters  $a_0$  and  $a_1$  can be done using appropriate software that uses the replicate weights to estimate the standard errors of the regression parameters. If the test of significance on  $a_1$  cannot reject the null hypothesis  $H_0: a_1 = 0$ , then it must be concluded that scores for male teachers and female teachers are not significantly different.

If  $\hat{\theta}$  is one of the statistics described above and  $se(\hat{\theta})$  is the standard error of  $\hat{\theta}$ , confidence intervals about zero can easily be obtained by computing the following boundaries:

$$lower_{\alpha} = \hat{\theta} - t_{\frac{\alpha}{2}, df} se(\hat{\theta})$$

and

$$upper_{\alpha} = \hat{\theta} + t_{\frac{\alpha}{2}, df} se(\hat{\theta})$$

where  $1 - \alpha$  is the pre-set confidence level (e.g.  $1 - \alpha = 0.95$ ) and  $t_{\frac{\alpha}{2}, df}$  is  $1 - \frac{\alpha}{2}$  percentile of the student distribution with  $df$  degrees of freedom. In most applications,  $df$  will be large enough to allow the use of the standard normal deviate  $z_{1-\frac{\alpha}{2}}$  (e.g.  $z_{1-\frac{\alpha}{2}} = 1.96$  for  $\alpha = 0.05$ ). However, in order to confirm the number of degrees of freedom, one should verify how many zones actually contribute to the statistic  $\hat{\theta}$  and how many BRR replicates contribute to the computation of  $se(\hat{\theta})$ . The IEA IDB Analyzer provides the number of variance zones contributing to a variance estimate as an output parameter for any analysis.

#### 9.6.4. Design effect (deff) and effective sample size

Sampling within complex surveys such as TALIS is known to be “less efficient” than simple random samples of the same size. Usual explanations include the fact that respondents are selected in groups of individuals sharing many characteristics, such as leadership, environment, professional training, equipment and so on. Stratification and weighting can also affect the efficiency of a sampling design. This effect, often causing a loss in efficiency is usually summarised in a statistic called “design effect” or *deff* (Kish, 1965<sup>[11]</sup>). The design effect for a statistic and a sampling plan is the ratio of the variance of the estimate under the sampling plan to the variance of the same estimate under simple random sampling (SRS) of the same size. In the case of TALIS, the true design effect was approximated by:

$$deff(\hat{\theta}, BRR) = \frac{\hat{V}_{Fay}(\hat{\theta})}{\hat{V}_{SRS}(\hat{\theta})}$$

where the estimate under SRS is unweighted.

Alternatively, the design effect can be regarded as the ratio of sample sizes. The “effective sample size” describes the sample size of the complex survey adjusted for the design effect:

$$n_{effective} = \frac{n}{deff(\hat{\theta}, BRR)}$$

The following tables give the estimated design effect for selected variables from the principal/leader questionnaires (Table 9.5 to Table 9.9) and the teacher/staff questionnaires (Table 9.10 to Table 9.15), by the participating country/territory. *Deff* values near 1 indicate that the design was as precise as a simple random sample of the same size. *Deff* values larger than 1 indicate that the sampling design was less efficient than a simple random sample of the same size; *deff* values smaller than 1 indicate a gain in precision. Alternatively, *deff* values indicate by what factor the sample size was affected: the larger the *deff*, the smaller the effective sample size; reciprocally, the smaller the *deff*, the larger the effective sample size.

Because the value of the *deff* depends on the design itself (efficiency of the stratification, clustering, sample size) and on the true sampling variance of the variable in the population, it varies from one variable to the next.

While design effects in international large-scale assessments ILSA are mostly driven by the effects of cluster sampling, *deff* for principal/leader data are exclusively due to the effects of stratification and weighting as no clustering occurs for these target populations. While stratification has the potential to increase the efficiency of a sampling design, weighting – accounting for unequal selection probabilities and varying non-response patterns – can affect the *deff* in both directions. In most cases, largely varying weights increase sampling error and the *deff*. Due to the TALIS sampling approach for schools/settings (selection with probabilities proportional to size) and the largely varying final school/setting weights being

a consequence of this, effects of the *deff* can be significant. As can be seen in Table 9.5 to Table 9.9 however, the samples for principal/leaders are still often as efficient as a simple random sample (*deff* of about 1). Relatively large sampling errors for these populations are due to the fact that the sample size is relatively small (200 principals/180 leaders).

**Table 9.5. Estimated design effects for selected variables, ISCED level 2, principal data**

| Country/territory           | Diversity beliefs | Academic rigor | Job satisfaction, overall | Instructional leadership |
|-----------------------------|-------------------|----------------|---------------------------|--------------------------|
|                             | T4PDIVBF          | T4PACADT       | T4PJOB SAT                | T4PLEADS                 |
| Albania                     | 1.21              | 1.17           | 0.92                      | 1.33                     |
| Alberta (Canada)            | 1.38              | 1.42           | 1.75                      | 1.86                     |
| Australia                   | 1.28              | 1.25           | 1.28                      | 1.93                     |
| Austria                     | 1.20              | 1.87           | 1.14                      | 1.62                     |
| Azerbaijan                  | 1.99              | 1.39           | 1.52                      | 1.63                     |
| Bahrain                     | 1.00              | 1.02           | 0.98                      | 0.82                     |
| Belgium                     | 1.89              | 2.00           | 1.29                      | 1.69                     |
| Flemish Community (Belgium) | 1.63              | 1.73           | 1.34                      | 1.12                     |
| French Community (Belgium)  | 2.05              | 1.23           | 1.04                      | 1.43                     |
| Brazil                      | 1.20              | 1.63           | 1.29                      | 1.26                     |
| Bulgaria                    | 1.22              | 1.30           | 1.18                      | 1.51                     |
| Chile                       | 1.98              | 2.83           | 2.73                      | 2.46                     |
| Colombia                    | 1.18              | 1.27           | 1.01                      | 2.11                     |
| Costa Rica                  | 1.81              | 1.65           | 1.64                      | 1.58                     |
| Croatia                     | 1.03              | 1.35           | 1.31                      | 1.09                     |
| Cyprus                      | 0.83              | 0.86           | 0.74                      | 0.95                     |
| Czechia                     | 1.27              | 1.30           | 1.34                      | 1.09                     |
| Denmark                     | 1.38              | 1.22           | 1.23                      | 1.81                     |
| Estonia                     | 1.21              | 0.82           | 0.99                      | 1.26                     |
| Finland                     | 1.58              | 1.21           | 1.52                      | 1.39                     |
| France                      | 1.03              | 1.09           | 1.06                      | 1.33                     |
| Hungary                     | 1.24              | 1.09           | 1.20                      | 1.14                     |
| Iceland                     | 1.15              | 0.99           | 0.72                      | 0.83                     |
| Israel                      | 1.70              | 2.25           | 2.23                      | 2.41                     |
| Italy                       | 0.94              | 0.82           | 1.24                      | 1.53                     |
| Japan                       | 0.98              | 1.17           | 1.31                      | 1.12                     |
| Kazakhstan                  | 2.53              | 2.94           | 2.54                      | 1.85                     |
| Korea                       | 1.17              | 1.38           | 1.62                      | 0.91                     |
| Kosovo                      | 1.16              | 0.80           | 1.36                      | 0.95                     |
| Latvia                      | 1.76              | 1.39           | 1.84                      | 1.93                     |
| Lithuania                   | 1.34              | 1.64           | 2.03                      | 1.44                     |
| Malta                       | 1.09              | 0.91           | 1.11                      | 0.91                     |
| Montenegro                  | 0.94              | 1.05           | 0.84                      | 0.81                     |
| Morocco                     | 2.84              | 2.19           | 1.95                      | 1.91                     |
| Netherlands                 | 1.35              | 1.37           | 1.13                      | 1.75                     |
| New Zealand                 | 2.10              | 1.91           | 1.31                      | 1.09                     |
| North Macedonia             | 0.79              | 1.13           | 1.20                      | 1.16                     |
| Norway                      | 1.42              | 1.90           | 1.32                      | 1.38                     |
| Poland                      | 1.12              | 1.74           | 1.56                      | 1.52                     |
| Portugal                    | 1.46              | 0.94           | 1.69                      | 0.91                     |
| Romania                     | 1.36              | 1.59           | 1.46                      | 1.31                     |
| Saudi Arabia                | 1.20              | 1.15           | 0.97                      | 1.58                     |
| Serbia                      | 1.15              | 1.18           | 1.16                      | 1.24                     |
| Shanghai (China)            | 2.03              | 1.45           | 1.30                      | 1.51                     |

| Country/territory    | Diversity beliefs | Academic rigor | Job satisfaction, overall | Instructional leadership |
|----------------------|-------------------|----------------|---------------------------|--------------------------|
|                      | T4PDIVBF          | T4PACADT       | T4PJBSAT                  | T4PLEADS                 |
| Singapore            | 1.24              | 1.05           | 1.30                      | 0.81                     |
| Slovak Republic      | 0.90              | 1.18           | 1.11                      | 1.26                     |
| Slovenia             | 1.26              | 1.02           | 1.30                      | 1.58                     |
| South Africa         | 1.58              | 1.80           | 1.59                      | 1.20                     |
| Spain                | 2.40              | 2.01           | 3.64                      | 2.65                     |
| Sweden               | 1.51              | 1.15           | 1.53                      | 1.66                     |
| Türkiye              | 1.26              | 1.60           | 1.03                      | 1.63                     |
| United Arab Emirates | 1.15              | 1.05           | 1.21                      | 1.29                     |
| United States        | 2.81              | 5.31           | 0.92                      | 4.06                     |
| Uzbekistan           | 1.20              | 1.05           | 0.93                      | 1.50                     |
| Viet Nam             | 1.20              | 1.24           | 0.94                      | 1.25                     |

Table 9.6. Estimated design effects for selected variables, ISCED level 1, principal data

| Country/territory           | Diversity beliefs | Academic rigor | Job satisfaction, overall | Instructional leadership |
|-----------------------------|-------------------|----------------|---------------------------|--------------------------|
|                             | T4PDIVBF          | T4PACADT       | T4PJBSAT                  | T4PLEADS                 |
| Australia                   | 1.16              | 1.44           | 1.05                      | 1.12                     |
| Belgium                     | 1.33              | 0.98           | 1.25                      | 1.34                     |
| Flemish Community (Belgium) | 1.17              | 1.06           | 1.01                      | 1.09                     |
| French Community (Belgium)  | 1.52              | 1.11           | 1.27                      | 1.19                     |
| Brazil                      | 1.43              | 1.27           | 1.31                      | 1.09                     |
| France                      | 1.02              | 0.94           | 0.96                      | 1.08                     |
| Japan                       | 0.81              | 0.96           | 1.36                      | 1.08                     |
| Korea                       | 2.02              | 2.15           | 1.86                      | 1.54                     |
| Morocco                     | 1.12              | 1.68           | 1.59                      | 1.38                     |
| Netherlands                 | 0.89              | 0.93           | 1.22                      | 1.10                     |
| New Zealand                 | 1.98              | 1.48           | 1.17                      | 1.08                     |
| Saudi Arabia                | 1.52              | 0.95           | 1.12                      | 1.35                     |
| Slovenia                    | 1.29              | 1.18           | 1.24                      | 1.56                     |
| Spain                       | 1.90              | 1.84           | 2.24                      | 1.87                     |
| Türkiye                     | 1.38              | 1.05           | 1.13                      | 1.29                     |
| United Arab Emirates        | 1.13              | 1.21           | 1.07                      | 1.07                     |

Table 9.7. Estimated design effects for selected variables, ISCED level 3, principal data

| Country/territory           | Diversity beliefs | Academic rigor | Job satisfaction, overall | Instructional leadership |
|-----------------------------|-------------------|----------------|---------------------------|--------------------------|
|                             | T4PDIVBF          | T4PACADT       | T4PJBSAT                  | T4PLEADS                 |
| Croatia                     | 1.50              | 1.28           | 1.44                      | 1.62                     |
| Denmark                     | 1.87              | 2.14           | 1.49                      | 1.26                     |
| Flemish Community (Belgium) | 1.27              | 0.76           | 1.12                      | 1.24                     |
| Portugal                    | 1.50              | 1.60           | 1.08                      | 1.49                     |
| Saudi Arabia                | 1.20              | 1.38           | 1.20                      | 1.14                     |
| Slovenia                    | 0.76              | 0.79           | 1.31                      | 0.88                     |
| Türkiye                     | 1.40              | 1.42           | 1.23                      | 1.34                     |
| United Arab Emirates        | 0.95              | 0.76           | 1.25                      | 1.53                     |

Table 9.8. Estimated design effects for selected variables, ISCED level 02, leader data

| Country/territory           | Work experience | Time spent on leadership tasks | Leader innovations in the ECEC setting | Job satisfaction |
|-----------------------------|-----------------|--------------------------------|----------------------------------------|------------------|
|                             | SL2G05B         | SL2G31B                        | S2LEADSPL2                             | SL2G43I          |
| Chile                       | 1.06            | 1.15                           | 1.23                                   | 1.36             |
| Colombia                    | 3.17            | 2.91                           | 3.49                                   | 2.03             |
| Denmark                     | 1.33            | 1.32                           | 1.34                                   | 0.98             |
| Finland                     | 1.12            | 1.14                           | 1.12                                   | 1.56             |
| Flemish Community (Belgium) | 1.27            | 1.13                           | 1.45                                   | 1.27             |
| Germany                     | 1.05            | 0.84                           | 0.93                                   | 1.05             |
| Ireland                     | 1.14            | 1.91                           | 1.93                                   | 2.37             |
| Israel                      | 0.95            | 1.14                           | 0.91                                   | 0.74             |
| Japan                       | 1.69            | 1.62                           | 1.67                                   | 1.40             |
| Morocco                     | 0.83            | 0.98                           | 0.71                                   | 0.73             |
| New Zealand                 | 1.41            | 1.63                           | 1.18                                   | 1.59             |
| Norway                      | 1.58            | 1.21                           | 1.16                                   | 1.02             |
| Spain                       | 2.19            | 1.82                           | 2.79                                   | 1.63             |
| Sweden                      | 1.14            | 2.59                           | 2.06                                   | 2.15             |
| Türkiye                     | 1.22            | 1.26                           | 1.47                                   | 1.15             |

Table 9.9. Estimated design effects for selected variables, U3, leader data

| Country/territory           | Work experience | Time spent on leadership tasks | Leader innovations in the ECEC setting | Job satisfaction |
|-----------------------------|-----------------|--------------------------------|----------------------------------------|------------------|
|                             | SL2G05B         | SL2G31B                        | S2LEADSPL2                             | SL2G43I          |
| Flemish Community (Belgium) | 2.94            | 2.23                           | 1.60                                   | 1.59             |
| Germany                     | 1.10            | 0.92                           | 1.00                                   | 0.85             |
| Ireland                     | 1.88            | 1.55                           | 1.21                                   | 1.85             |
| Israel                      | 1.02            | 1.85                           | 1.89                                   | 1.52             |
| New Brunswick (Canada)      | 1.18            | 1.10                           | 1.20                                   | 1.41             |
| New Zealand                 | 0.37            | 1.96                           | 1.24                                   | 2.36             |
| Norway                      | 1.67            | 1.22                           | 1.26                                   | 1.06             |
| Quebec (Canada)             | 0.94            | 1.26                           | 1.17                                   | 1.76             |

Table 9.10. Estimated design effects for selected variables, ISCED level 2, teacher data

| Country/territory           | Job satisfaction, overall | Exchange of information and ideas among teachers | Teacher self-efficacy, overall | Clarity of instruction |
|-----------------------------|---------------------------|--------------------------------------------------|--------------------------------|------------------------|
|                             | T4JOBSAT                  | T4EXINF                                          | T4SELF                         | T4CLAIN                |
| Albania                     | 3.20                      | 2.35                                             | 1.53                           | 1.96                   |
| Alberta (Canada)            | 5.11                      | 3.82                                             | 3.31                           | 1.78                   |
| Australia                   | 1.64                      | 1.61                                             | 1.30                           | 1.23                   |
| Austria                     | 2.71                      | 1.72                                             | 1.45                           | 1.37                   |
| Azerbaijan                  | 3.13                      | 1.95                                             | 2.62                           | 2.17                   |
| Bahrain                     | 1.02                      | 0.89                                             | 0.86                           | 1.14                   |
| Belgium                     | 2.42                      | 3.36                                             | 1.91                           | 1.36                   |
| Flemish Community (Belgium) | 2.15                      | 4.83                                             | 1.58                           | 1.24                   |
| French Community (Belgium)  | 2.17                      | 1.50                                             | 1.40                           | 1.50                   |
| Brazil                      | 2.67                      | 2.05                                             | 1.33                           | 1.42                   |
| Bulgaria                    | 3.82                      | 3.17                                             | 2.44                           | 2.14                   |
| Chile                       | 2.57                      | 2.97                                             | 2.49                           | 2.91                   |

| Country/territory    | Job satisfaction,<br>overall | Exchange of information<br>and ideas among teachers | Teacher self-efficacy,<br>overall | Clarity of instruction |
|----------------------|------------------------------|-----------------------------------------------------|-----------------------------------|------------------------|
|                      | T4JOBSAT                     | T4EXINF                                             | T4SELF                            | T4CLAIN                |
| Colombia             | 3.15                         | 3.94                                                | 3.21                              | 2.60                   |
| Costa Rica           | 2.92                         | 2.15                                                | 1.69                              | 1.51                   |
| Croatia              | 2.42                         | 1.18                                                | 2.04                              | 1.74                   |
| Cyprus               | 1.20                         | 1.07                                                | 1.29                              | 1.28                   |
| Czechia              | 2.46                         | 1.86                                                | 1.37                              | 1.55                   |
| Denmark              | 1.91                         | 2.45                                                | 2.24                              | 1.60                   |
| Estonia              | 2.23                         | 1.48                                                | 1.61                              | 1.27                   |
| Finland              | 2.54                         | 2.26                                                | 1.42                              | 1.69                   |
| France               | 1.86                         | 1.65                                                | 1.43                              | 1.16                   |
| Hungary              | 2.59                         | 1.72                                                | 2.03                              | 1.39                   |
| Iceland              | 0.95                         | 1.13                                                | 0.93                              | 1.21                   |
| Israel               | 2.05                         | 1.88                                                | 2.09                              | 1.50                   |
| Italy                | 1.81                         | 1.38                                                | 2.34                              | 1.08                   |
| Japan                | 2.36                         | 1.70                                                | 1.03                              | 1.28                   |
| Kazakhstan           | 3.21                         | 2.93                                                | 2.09                              | 2.00                   |
| Korea                | 2.14                         | 2.33                                                | 1.63                              | 1.18                   |
| Kosovo               | 1.73                         | 1.93                                                | 2.21                              | 2.19                   |
| Latvia               | 1.94                         | 2.03                                                | 1.66                              | 2.16                   |
| Lithuania            | 3.12                         | 1.64                                                | 1.72                              | 1.33                   |
| Malta                | 1.02                         | 0.95                                                | 0.94                              | 0.91                   |
| Montenegro           | 1.11                         | 1.20                                                | 1.19                              | 1.23                   |
| Morocco              | 4.30                         | 3.21                                                | 1.66                              | 2.55                   |
| Netherlands          | 1.89                         | 2.31                                                | 2.52                              | 1.56                   |
| New Zealand          | 2.45                         | 2.68                                                | 1.81                              | 0.77                   |
| North Macedonia      | 2.92                         | 1.73                                                | 2.16                              | 1.45                   |
| Norway               | 3.23                         | 3.72                                                | 2.09                              | 1.64                   |
| Poland               | 2.78                         | 1.84                                                | 2.13                              | 1.89                   |
| Portugal             | 1.90                         | 2.33                                                | 1.20                              | 1.04                   |
| Romania              | 3.28                         | 1.43                                                | 1.93                              | 1.62                   |
| Saudi Arabia         | 1.91                         | 1.35                                                | 1.26                              | 1.18                   |
| Serbia               | 2.24                         | 1.87                                                | 1.70                              | 1.62                   |
| Shanghai (China)     | 2.47                         | 1.98                                                | 1.93                              | 1.22                   |
| Singapore            | 1.92                         | 0.99                                                | 1.80                              | 1.77                   |
| Slovak Republic      | 3.26                         | 1.57                                                | 1.57                              | 1.20                   |
| Slovenia             | 1.70                         | 1.66                                                | 1.25                              | 1.22                   |
| South Africa         | 3.07                         | 3.52                                                | 2.29                              | 2.05                   |
| Spain                | 5.07                         | 3.41                                                | 2.68                              | 2.07                   |
| Sweden               | 3.00                         | 1.92                                                | 3.30                              | 2.71                   |
| Türkiye              | 4.18                         | 2.38                                                | 1.50                              | 1.60                   |
| United Arab Emirates | 4.82                         | 6.02                                                | 3.34                              | 3.65                   |
| United States        | 3.74                         | 3.67                                                | 3.09                              | 2.35                   |
| Uzbekistan           | 2.78                         | 2.34                                                | 2.13                              | 3.13                   |
| Viet Nam             | 2.98                         | 2.12                                                | 2.38                              | 1.57                   |



Table 9.11. Estimated design effects for selected variables, ISCED level 1, teacher data

| Country/territory           | Job satisfaction,<br>overall | Exchange of information<br>and ideas among teachers | Teacher self-efficacy,<br>overall | Clarity of instruction |
|-----------------------------|------------------------------|-----------------------------------------------------|-----------------------------------|------------------------|
|                             | T4JOBSAT                     | T4EXINF                                             | T4SELF                            | T4CLAIN                |
| Australia                   | 2.40                         | 2.39                                                | 2.07                              | 2.53                   |
| Belgium                     | 2.69                         | 1.74                                                | 1.69                              | 1.67                   |
| Flemish Community (Belgium) | 2.32                         | 1.45                                                | 1.40                              | 1.63                   |
| French Community (Belgium)  | 3.10                         | 1.85                                                | 1.80                              | 1.45                   |
| Brazil                      | 3.02                         | 3.27                                                | 1.92                              | 1.42                   |
| France                      | 1.83                         | 2.16                                                | 1.59                              | 1.45                   |
| Japan                       | 2.76                         | 2.11                                                | 1.82                              | 1.56                   |
| Korea                       | 1.97                         | 1.66                                                | 1.21                              | 1.86                   |
| Morocco                     | 3.55                         | 4.98                                                | 4.01                              | 3.25                   |
| Netherlands                 | 2.29                         | 2.36                                                | 0.99                              | 1.21                   |
| New Zealand                 | 2.64                         | 3.40                                                | 1.60                              | 1.49                   |
| Saudi Arabia                | 2.90                         | 1.47                                                | 1.48                              | 1.39                   |
| Slovenia                    | 1.70                         | 1.96                                                | 1.51                              | 1.11                   |
| Spain                       | 5.62                         | 3.38                                                | 3.80                              | 3.02                   |
| Türkiye                     | 2.11                         | 2.34                                                | 2.24                              | 2.07                   |
| United Arab Emirates        | 5.71                         | 2.91                                                | 2.97                              | 2.75                   |

Table 9.12. Estimated design effects for selected variables, ISCED level 3, teacher data

| Country/territory           | Job satisfaction,<br>overall | Exchange of information<br>and ideas among teachers | Teacher self-efficacy,<br>overall | Clarity of instruction |
|-----------------------------|------------------------------|-----------------------------------------------------|-----------------------------------|------------------------|
|                             | T4JOBSAT                     | T4EXINF                                             | T4SELF                            | T4CLAIN                |
| Croatia                     | 1.79                         | 2.05                                                | 1.49                              | 1.20                   |
| Denmark                     | 3.56                         | 2.05                                                | 1.95                              | 2.12                   |
| Flemish Community (Belgium) | 2.80                         | 2.40                                                | 1.80                              | 1.42                   |
| Portugal                    | 2.03                         | 2.77                                                | 1.37                              | 1.03                   |
| Saudi Arabia                | 2.14                         | 2.33                                                | 1.61                              | 1.62                   |
| Slovenia                    | 1.22                         | 1.46                                                | 1.38                              | 1.24                   |
| Türkiye                     | 3.70                         | 1.38                                                | 2.25                              | 1.23                   |
| United Arab Emirates        | 4.18                         | 5.34                                                | 7.06                              | 3.27                   |

Table 9.13. Estimated design effects for selected variables, ISCED level 02, staff data

| Country/territory           | Professional development<br>needs: pedagogical | Time spent with<br>children | Facilitating prosocial<br>behaviour | Job satisfaction |
|-----------------------------|------------------------------------------------|-----------------------------|-------------------------------------|------------------|
|                             | S2PDNPED                                       | SS2G28A                     | S2PRSOC                             | SS2G45L          |
| Chile                       | 4.89                                           | 2.06                        | 1.64                                | 1.30             |
| Colombia                    | 4.07                                           | 2.09                        | 3.95                                | 4.06             |
| Denmark                     | 1.54                                           | 1.02                        | 0.99                                | 1.57             |
| Finland                     | 1.52                                           | 1.38                        | 1.36                                | 1.96             |
| Flemish Community (Belgium) | 1.33                                           | 1.34                        | 1.16                                | 1.36             |
| Germany                     | 1.33                                           | 1.17                        | 1.76                                | 1.84             |
| Ireland                     | 1.60                                           | 2.40                        | 1.65                                | 3.33             |
| Israel                      | 1.79                                           | 1.49                        | 1.14                                | 1.03             |
| Japan                       | 1.27                                           | 1.31                        | 1.72                                | 2.13             |
| Morocco                     | 2.47                                           | 1.57                        | 1.57                                | 1.64             |

| Country/territory | Professional development needs: pedagogical | Time spent with children | Facilitating prosocial behaviour | Job satisfaction |
|-------------------|---------------------------------------------|--------------------------|----------------------------------|------------------|
|                   | S2PDNPED                                    | SS2G28A                  | S2PRSOC                          | SS2G45L          |
| New Zealand       | 2.45                                        | 3.55                     | 1.28                             | 2.97             |
| Norway            | 1.43                                        | 1.46                     | 1.42                             | 1.31             |
| Spain             | 2.04                                        | 2.44                     | 4.39                             | 2.64             |
| Sweden            | 1.84                                        | 1.31                     | 1.61                             | 1.57             |
| Türkiye           | 1.38                                        | 1.58                     | 1.30                             | 1.89             |

**Table 9.14. Estimated design effects for selected variables, U3, staff data**

| Country/territory           | Professional development needs: pedagogical | Time spent with children | Facilitating prosocial behaviour | Job satisfaction |
|-----------------------------|---------------------------------------------|--------------------------|----------------------------------|------------------|
|                             | S2PDNPED                                    | SS2G28A                  | S2PRSOC                          | SS2G45L          |
| Flemish Community (Belgium) | 1.48                                        | 1.52                     | 1.48                             | 1.77             |
| Germany                     | 1.63                                        | 1.18                     | 1.30                             | 1.54             |
| Ireland                     | 2.48                                        | 2.03                     | 1.64                             | 2.25             |
| Israel                      | 1.42                                        | 1.63                     | 1.81                             | 2.05             |
| New Brunswick (Canada)      | 1.85                                        | 1.01                     | 1.16                             | 0.87             |
| New Zealand                 | 1.44                                        | 3.16                     | 0.79                             | 2.75             |
| Norway                      | 1.32                                        | 1.34                     | 1.86                             | 1.56             |
| Quebec (Canada)             | 1.36                                        | 1.24                     | 2.01                             | 1.71             |

**Table 9.15. Estimated design effects for selected variables, TKS, teacher data**

| Country/territory | Joy of teaching | Exchange of information and ideas among teachers | Self-efficacy in instruction | Clarity of instruction |
|-------------------|-----------------|--------------------------------------------------|------------------------------|------------------------|
|                   | T4JOYTCH        | T4EXINF                                          | T4SEINS                      | T4CLAIN                |
| Chile             | 2.53            | 3.03                                             | 2.59                         | 2.86                   |
| Croatia           | 1.56            | 1.95                                             | 2.04                         | 1.27                   |
| Morocco           | 2.12            | 2.78                                             | 2.49                         | 2.30                   |
| Poland            | 2.46            | 2.18                                             | 2.18                         | 1.90                   |
| Portugal          | 1.79            | 1.49                                             | 1.07                         | 1.35                   |
| Saudi Arabia      | 1.33            | 1.43                                             | 1.27                         | 1.53                   |
| South Africa      | 1.70            | 1.87                                             | 2.17                         | 2.35                   |
| United States     | 2.37            | 2.41                                             | 2.65                         | 2.67                   |

The minimum sample sizes for teachers/staff determined for TALIS were derived assuming a design effect of 5.2 for ISCED levels 1, 2 and 3, and of 2 for ISCED level 02 and U3, based on the observed deff in earlier cycles (see Chapter 5). Table 9.10 to Table 9.15 above show that the sample designs implemented in the various participating countries/territories outperformed the design hypotheses for many presented variables for most countries/territories, thus resulting in effective samples that were larger than the expected nominal 400 teachers/staff members. This allows estimation of population parameters with higher precision and opens up greater potential for subgroup analysis.

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# 10 Data adjudication

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This chapter covers the adjudication of the OECD Teaching and Learning International Survey (TALIS) 2024 data collection process and data. The first two sections of the chapter address the purpose of adjudication and what was adjudicated during TALIS 2024. The third section briefly describes the criteria used to assess each parameter. The recommended usage rating for each participating country/territory and component are presented in the last section. Complete tabulations of unweighted and weighted participation rates can be found in Annex F.

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## 10.1. The general adjudication process in TALIS

The OECD Teaching and Learning International Survey (TALIS) is designed to produce data that are internationally comparable and can inform policy. Through adjudication, the consortium verifies that survey implementation is consistent with these aims and identifies concerns that could affect the use of the data.

This chapter describes the adjudication process for TALIS 2024. The criteria used to assess the quality of each element appear in the third section of the chapter, while the fourth focuses on what each rating means in practice. The outcomes of the adjudication are given at the end of this section. Full tabulation of unweighted and weighted participation rates can be found in Annex F.

## 10.2. What was adjudicated in TALIS?

The basic principle guiding adjudication was to determine whether the data released to the countries/territories and to the OECD were “fit for use” as intended. The consortium looked at every step of the survey process to determine their effects on the overall utility of the data. For example:

- **Questionnaire adaptation to the national context:** incomplete questionnaires (national questionnaires needed to include all introductory texts and questions in the international source versions as well as the corresponding notes, instructions, response categories and coding schemes); questions removed or modified without agreement.
- **Translation and verification:** changes to national translations of trend items that would make comparisons difficult.
- **Quality of sampling frame (before sampling and confirmation at weighting):** measure of size disproportionate to what was known of the participating country/territory; missing values.
- **Handling of out-of-scope and of refusal units:** for example, a replaced unit found to be out of scope.
- **Handling of replacement and “volunteer” units:** for example, replacement schools/early childhood education and care (ECEC) settings participating when the original school/setting was also on the database.
- **Teacher/staff lists and within-school/-setting sampling:** incomplete teacher/staff lists or apparent biased selection of teacher/staff sample.
- **Main survey administration:** non-compliance with the technical standards and survey operation procedure units, rules and guidelines; failure to administer the data collection within the agreed data collection window; failure to administer the questionnaires according to the tracking form.
- **Data collection (paper and online modes):** missing records (physical or electronic).
- **Data cleaning:** issues with cleaning and editing; need to make post-collection call-backs to national project managers (NPMs).
- **Quality observer reports:** reported issues included differences in the documentation of national decisions on translation verification feedback and the actual implementation in the final national instruments; unnatural and non-fluent national translations; deviations in sampling procedures for listing all eligible teachers/staff in a school/setting; failure to administer the questionnaires according to the tracking form.
- **Weighting:** miscoded schools/settings or teachers/staff; only rough comparisons of survey results with frame information; need to make call-backs to NPMs; estimates of population sizes not matching information on frame; school/setting listings too short; school/setting identifier with no matching unit entry on frame.

- **Participation rates of principals/ECEC setting leaders and teachers/ECEC staff:** weighted and unweighted rates strikingly different.

During the adjudication sessions in November and December 2024, each individual dataset (one per component per education system) was submitted to the same examination. As was the case for TALIS 2018, the consortium adjudicated the principal/school and leader/setting data independently of the teacher/staff data.

### 10.3. The process and criteria for assessment

The members of the consortium responsible for a particular key step of the survey presented, discussed and assessed any unresolved issues that might reduce the final fitness for use of each dataset. Consortium members considered that any problem that had already been resolved did not need to be discussed. Otherwise, the adjudication committee worked through a series of questions to help determine the nature of the issue and its potential impact on data quality:

- What was the problem?
- What solutions had been tried and failed?
- What solutions had partially worked and to what extent?
- Was the perceived impact such that words of caution should be issued to users?
- Did the adjudication committee feel that international (or national) comparisons appeared to have been compromised or limited to the largest subpopulations?
- Was more information from countries/territories needed to assess the issue in full?

Participating countries/territories where 75% participation had not been met were asked to file a non-response bias analysis (NRBA). It should be clear that “bias” is a theoretical construct that cannot be measured or estimated from a single survey (Kish, 1965<sup>[11]</sup>). The observed difference between a survey estimate and the corresponding true value (as derived from administrative sources, say) could be purely due to sampling error, or due to a flawed selection or implementation process, resulting in systematic underrepresentation of certain groups, or both.

Moreover, it must be understood that the NRBA reports can only give an idea of the closeness of the survey estimates to the corresponding known population values. The NRBA also indicates how the addition of replacement schools/settings does, or does not, change how sample estimates are close to the corresponding population values. The NRBA reports cannot provide detailed information on how well the data under analysis would yield estimates that are comparable to those of another participating country/territory, nor can they foretell how reliable estimates for sub-populations will be.

Once the committee had assessed each survey, they formulated an adjudication rating. While the rating was mostly dictated by the participation rate thresholds set in the TALIS 2024 Technical Standards (OECD, 2025<sup>[21]</sup>), the adjudication committee at times improved the rating of a dataset if, after expert consideration, unique and favourable conditions were met (e.g. closeness to the threshold value and/or the NRBA report showing evidence for negligible bias risks).

The adjudication rating is made at the country/territory level. However, potential non-response bias is specific to each estimate. Therefore, some estimates of countries/territories with an adjudication rating of “good” might still have a high non-response bias; correspondingly, some estimates of countries/territories with an adjudication rating of “poor” might still be reliable.

## 10.4. Adjudication ratings for participants

For easy reference, Tables 10.1 and 10.2 reproduce the adjudication tables found in the TALIS 2024 Technical Standards (OECD, 2025<sub>[2]</sub>).

**Table 10.1. Adjudication rules for school/setting or principal/leader data**

| Principal/leader participation before replacement | Principal/leader participation after replacement | Risk of non-response bias | Rating       |
|---------------------------------------------------|--------------------------------------------------|---------------------------|--------------|
| ≥75%                                              | ≥75%                                             |                           | Good         |
| ≥50% but <75%                                     | ≥75%                                             |                           | Fair (A)     |
| ≥50% but <75%                                     | ≥50% but <75%                                    | Low                       | Fair (C)     |
| ≥50% but <75%                                     | ≥50% but <75%                                    | High                      | Poor (D)     |
| <50%                                              |                                                  |                           | Insufficient |

Source: TALIS Technical Standard 3.26

**Table 10.2. Adjudication rules for teacher/staff data**

| School/setting participation before replacement | School/setting participation after replacement | Teacher/staff participation after school/setting replacement | Risk of teacher/staff non-response bias | Rating       |
|-------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|-----------------------------------------|--------------|
| ≥75%                                            | ≥75%                                           | ≥75%                                                         |                                         | Good         |
| ≥75%                                            | ≥50% but <75%                                  |                                                              |                                         | Fair (A)     |
| ≥50% but <75%                                   | ≥75%                                           | ≥75%                                                         |                                         | Fair (B)     |
| ≥50% but <75%                                   | ≥75%                                           | ≥50% but <75%                                                | Low                                     | Fair (C)     |
| ≥50% but <75%                                   | ≥75%                                           | ≥50% but <75%                                                | High                                    | Poor (D)     |
| ≥50% but <75%                                   | ≥50% but <75%                                  |                                                              |                                         | Poor (E)     |
| <50%                                            | ≥75%                                           |                                                              |                                         | Poor (F)     |
| <50%                                            | <75%                                           |                                                              |                                         | Insufficient |

Source: TALIS Technical Standard 3.27

The aim of the following bulleted list is to help data users understand what constitutes limitations on use or quality of the data:

- **Good:** The data of the participating country/territory can be used for all reporting and analytical purposes and should be included in international comparisons.
- **Fair (A):** National and subnational estimates can be produced; some teacher/staff characteristics may be less precise, as indicated by a larger standard error (s.e.), hence the warning “fair”, but with no additional warnings to users deemed necessary.
- **Fair (B, only for teacher/staff data adjudication):** National and subnational estimates can be produced; some subnational estimates may be of lower precision (larger s.e.) if the sample size is locally low, hence the warning “fair”, but with no additional warnings to users considered necessary.
- **Fair (C):** National and subnational estimates can be produced; some subnational estimates may be of lower precision (larger s.e.) if the sample size is locally low, hence the warning “fair”, but with the possible inclusion of a note on data quality that points to the outcome of the NRBA; school/setting participation somewhat lower than under (B), meaning that comparison of subnational estimates needs to be done with care given that some of these results are based on just a few schools/settings; comparison of small subnational estimates with similar groups from



other countries/territories is unlikely to uncover statistically meaningful differences because of potentially overly large standard errors.

- **Poor (D):** In addition to the warnings issued for the previous category, a note that warns users of higher risks of non-response bias in some estimates should be appended; comparisons of subnational estimates need to be limited to the groups with the larger sample sizes (because the sample at this point represents between 37% and 56% of teachers/staff from a relatively small sample of schools/settings, comparisons with similar groups in foreign countries/territories is inadvisable).
- **Poor (E, only for teacher/staff data adjudication):** Subnational estimates are not recommended; a note pointing out the difficulty of obtaining a representative sample of schools/settings, therefore, needs to be appended.
- **Poor (F, only for teacher/staff data adjudication):** The limitations are similar to those for line E, but with the inclusion of a note pointing out the difficulty of obtaining at least 50% participation of the selected sample of schools/settings; there is an evident risk of having a non-representative sample of schools/settings.
- **Insufficient:** Weights should not be calculated for any official tabulations, meaning that data should not be incorporated into international tables, models, averages, etc. If such data are used despite this recommendation, it must be clearly indicated that samples rated as “insufficient” have a higher risk of being affected by non-response bias and should therefore be interpreted with caution.

Thus, the final ratings depended on participation rates before and after replacements, on data quality issues raised during the adjudication session and on the apparent severity of the non-response biases. The next 11 tables present the recommended rating for each participating country/territory, by component and population. Detailed results of unweighted and weighted participation can be found in Annex F.

## 10.5. Ratings by countries/territories

**Table 10.3. ISCED level 2: Principal participation and recommended ratings**

| Participating country/territory | Number of participating principals | Estimated size of school population | Principal participation before replacement (%) | Principal participation after replacement (%) | Recommended rating |
|---------------------------------|------------------------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------|--------------------|
| Albania                         | 282                                | 1 090                               | 99.6                                           | 100.0                                         | Good               |
| Alberta (Canada)                | 139                                | 1 152                               | 38.5                                           | 50.3                                          | Insufficient       |
| Australia                       | 181                                | 2 575                               | 63.0                                           | 89.9                                          | Fair               |
| Austria                         | 266                                | 1 446                               | 83.6                                           | 96.7                                          | Good               |
| Azerbaijan                      | 222                                | 4 090                               | 99.7                                           | 100.0                                         | Good               |
| Bahrain                         | 115                                | 116                                 | 99.1                                           | 99.1                                          | Good               |
| Belgium                         | 262                                | 1 226                               | 65.0                                           | 73.4                                          | Fair               |
| Flemish Community (Belgium)     | 139                                | 791                                 | 57.1                                           | 66.2                                          | Fair               |
| French Community (Belgium)      | 123                                | 436                                 | 76.0                                           | 83.8                                          | Good               |
| Brazil                          | 212                                | 56 460                              | 89.9                                           | 94.3                                          | Good               |
| Bulgaria                        | 208                                | 1 691                               | 97.7                                           | 98.7                                          | Good               |
| Chile                           | 362                                | 5 776                               | 70.0                                           | 84.3                                          | Fair               |
| Colombia                        | 189                                | 15 310                              | 63.8                                           | 68.5                                          | Fair               |
| Costa Rica                      | 183                                | 939                                 | 85.7                                           | 87.1                                          | Good               |
| Croatia                         | 259                                | 857                                 | 87.8                                           | 87.8                                          | Good               |
| Cyprus                          | 99                                 | 100                                 | 99.0                                           | 99.0                                          | Good               |

| Participating country/territory | Number of participating principals | Estimated size of school population | Principal participation before replacement (%) | Principal participation after replacement (%) | Recommended rating |
|---------------------------------|------------------------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------|--------------------|
| Czechia                         | 346                                | 2 819                               | 99.8                                           | 100.0                                         | Good               |
| Denmark                         | 189                                | 1 555                               | 54.9                                           | 80.9                                          | Fair               |
| Estonia                         | 192                                | 367                                 | 94.1                                           | 94.1                                          | Good               |
| Finland                         | 226                                | 723                                 | 99.6                                           | 100.0                                         | Good               |
| France                          | 171                                | 6 780                               | 86.0                                           | 87.0                                          | Good               |
| Hungary                         | 231                                | 2 665                               | 93.5                                           | 93.9                                          | Good               |
| Iceland                         | 109                                | 140                                 | 77.9                                           | 77.9                                          | Good               |
| Israel <sup>1</sup>             | 198                                | 1 232                               | 92.5                                           | 93.0                                          | Good               |
| Italy                           | 198                                | 5 799                               | 97.5                                           | 98.0                                          | Good               |
| Japan                           | 200                                | 10 277                              | 89.5                                           | 98.1                                          | Good               |
| Kazakhstan                      | 371                                | 6 676                               | 99.1                                           | 99.1                                          | Good               |
| Korea                           | 173                                | 3 085                               | 65.3                                           | 85.6                                          | Fair               |
| Kosovo                          | 222                                | 630                                 | 99.1                                           | 99.1                                          | Good               |
| Latvia                          | 213                                | 514                                 | 96.3                                           | 97.9                                          | Good               |
| Lithuania                       | 211                                | 738                                 | 98.7                                           | 100.0                                         | Good               |
| Malta                           | 50                                 | 55                                  | 90.9                                           | 90.9                                          | Good               |
| Montenegro                      | 130                                | 161                                 | 80.7                                           | 80.7                                          | Good               |
| Morocco                         | 398                                | 3 860                               | 99.7                                           | 100.0                                         | Good               |
| Netherlands                     | 78                                 | 1 345                               | 35.6                                           | 52.3                                          | Insufficient       |
| New Zealand                     | 90                                 | 1 871                               | 27.2                                           | 51.4                                          | Insufficient       |
| North Macedonia                 | 201                                | 335                                 | 99.6                                           | 99.6                                          | Good               |
| Norway                          | 147                                | 1 093                               | 44.5                                           | 69.7                                          | Insufficient       |
| Poland                          | 279                                | 12 502                              | 93.6                                           | 99.6                                          | Good               |
| Portugal                        | 224                                | 1 195                               | 98.8                                           | 99.3                                          | Good               |
| Romania                         | 216                                | 4 587                               | 100.0                                          | 100.0                                         | Good               |
| Saudi Arabia                    | 319                                | 7 743                               | 95.6                                           | 95.6                                          | Good               |
| Serbia                          | 199                                | 1 129                               | 98.5                                           | 99.5                                          | Good               |
| Shanghai (China)                | 205                                | 689                                 | 100.0                                          | 100.0                                         | Good               |
| Singapore                       | 154                                | 189                                 | 95.6                                           | 96.9                                          | Good               |
| Slovak Republic                 | 239                                | 1 608                               | 95.7                                           | 99.0                                          | Good               |
| Slovenia <sup>2</sup>           | 207                                | 443                                 | 77.4                                           | 79.1                                          | Good               |
| South Africa                    | 318                                | 7 806                               | 84.4                                           | 84.6                                          | Good               |
| Spain                           | 494                                | 7 151                               | 97.7                                           | 97.9                                          | Good               |
| Sweden                          | 183                                | 1 693                               | 86.4                                           | 88.8                                          | Good               |
| Türkiye                         | 226                                | 16 723                              | 98.5                                           | 98.5                                          | Good               |
| United Arab Emirates            | 210                                | 875                                 | 98.8                                           | 98.8                                          | Good               |
| United States <sup>3</sup>      | 152                                | 59 531                              | 48.0                                           | 59.4                                          | Insufficient       |
| Uzbekistan                      | 210                                | 10 485                              | 100.0                                          | 100.0                                         | Good               |
| Viet Nam                        | 202                                | 11 439                              | 100.0                                          | 100.0                                         | Good               |

Note: A school was deemed a participating school if the principal returned their questionnaire with at least one question answered.

ISCED: International Standard Classification of Education.

1. Israel: Ultra-Orthodox schools were excluded after the survey administration due to very low participation rates. They are not considered in the participation rate but contribute to the exclusion rate.

2. Slovenia: The school sample was identical for ISCED levels 1 and 2. Principals were asked to participate in both questionnaires but did not in many cases. Eleven items were copied between ISCED levels in these cases.

3. United States: The national centre managed questionnaire delivery from their own servers using the platform provided by the International Association for the Evaluation of Educational Achievement (IEA) in a single participant setup. Following data collection, the United States assessed disclosure risk and applied related measures based on federal requirements (<https://nces.ed.gov/fcsm/dpt/>). No documentation of these measures was provided.

Table 10.4. ISCED level 2: Teacher participation and recommended ratings

| Participating country/territory          | Number of participating schools | Number of participating teachers | Estimated size of teacher population | School participation before replacement (%) | School participation after replacement (%) | Teacher participation in participating schools | Overall teacher participation | Recommended rating |
|------------------------------------------|---------------------------------|----------------------------------|--------------------------------------|---------------------------------------------|--------------------------------------------|------------------------------------------------|-------------------------------|--------------------|
| Albania                                  | 282                             | 4 029                            | 11 830                               | 99.6                                        | 100.0                                      | 99.4                                           | 99.4                          | Good               |
| Alberta (Canada)                         | 153                             | 1 823                            | 11 190                               | 46.4                                        | 56.4                                       | 82.2                                           | 46.4                          | Insufficient       |
| Australia                                | 179                             | 3 035                            | 122 147                              | 66.6                                        | 88.5                                       | 86.7                                           | 76.7                          | Fair               |
| Austria                                  | 247                             | 4 335                            | 43 477                               | 77.5                                        | 89.8                                       | 85.9                                           | 77.2                          | Good               |
| Azerbaijan                               | 222                             | 4 307                            | 95 548                               | 99.5                                        | 100.0                                      | 98.4                                           | 98.4                          | Good               |
| Bahrain                                  | 116                             | 3 104                            | 4 581                                | 100.0                                       | 100.0                                      | 97.7                                           | 97.7                          | Good               |
| Belgium <sup>1</sup>                     | 273                             | 5 175                            | 40 763                               | 67.5                                        | 76.5                                       | 84.5                                           | 64.6                          | Fair               |
| Flemish Community (Belgium) <sup>2</sup> | 143                             | 2 444                            | 24 689                               | 58.1                                        | 68.3                                       | 84.2                                           | 57.5                          | Poor               |
| French Community (Belgium)               | 130                             | 2 731                            | 16 075                               | 81                                          | 88.4                                       | 84.7                                           | 74.9                          | Good               |
| Brazil                                   | 207                             | 3 009                            | 590 695                              | 89.9                                        | 92.4                                       | 95.2                                           | 87.9                          | Good               |
| Bulgaria                                 | 210                             | 3 629                            | 21 777                               | 97.9                                        | 99.6                                       | 99.1                                           | 98.7                          | Good               |
| Chile                                    | 353                             | 2 319                            | 59 796                               | 66.2                                        | 79.8                                       | 84.0                                           | 67.0                          | Fair               |
| Colombia                                 | 213                             | 3 010                            | 167 714                              | 71.7                                        | 77.2                                       | 91.9                                           | 70.9                          | Fair               |
| Costa Rica                               | 187                             | 3 026                            | 14 638                               | 87.6                                        | 89.0                                       | 94.2                                           | 83.8                          | Good               |
| Croatia                                  | 268                             | 3 163                            | 15 957                               | 90.5                                        | 90.5                                       | 82.6                                           | 74.8                          | Good               |
| Cyprus                                   | 99                              | 1 793                            | 4 151                                | 99.0                                        | 99.0                                       | 91.2                                           | 90.3                          | Good               |
| Czechia                                  | 346                             | 6 369                            | 49 671                               | 99.7                                        | 100.0                                      | 98.4                                           | 98.4                          | Good               |
| Denmark                                  | 189                             | 2 488                            | 23 083                               | 53.5                                        | 80.0                                       | 85.6                                           | 68.5                          | Fair               |
| Estonia                                  | 199                             | 3 339                            | 8 860                                | 97.5                                        | 97.5                                       | 89.1                                           | 86.9                          | Good               |
| Finland                                  | 226                             | 4 300                            | 20 980                               | 99.6                                        | 100.0                                      | 94.8                                           | 94.8                          | Good               |
| France                                   | 161                             | 2 877                            | 206 033                              | 80.2                                        | 81.7                                       | 76.4                                           | 62.4                          | Good               |
| Hungary                                  | 235                             | 3 890                            | 43 537                               | 95.1                                        | 95.5                                       | 92.6                                           | 88.4                          | Good               |
| Iceland                                  | 131                             | 1 427                            | 1 982                                | 94.2                                        | 94.2                                       | 81.6                                           | 76.9                          | Good               |
| Israel <sup>3</sup>                      | 196                             | 3 227                            | 35 940                               | 92.0                                        | 92.0                                       | 87.4                                           | 80.5                          | Good               |
| Italy                                    | 200                             | 3 874                            | 168 045                              | 98.5                                        | 99.0                                       | 92.4                                           | 91.5                          | Good               |
| Japan                                    | 201                             | 3 558                            | 209 963                              | 90.2                                        | 98.5                                       | 97.7                                           | 96.2                          | Good               |
| Kazakhstan                               | 377                             | 7 360                            | 205 012                              | 99.8                                        | 99.8                                       | 99.6                                           | 99.3                          | Good               |
| Korea                                    | 169                             | 3 098                            | 76 205                               | 65.3                                        | 83.7                                       | 91.0                                           | 76.2                          | Fair               |
| Kosovo                                   | 222                             | 3 281                            | 7 339                                | 99.1                                        | 99.1                                       | 91.4                                           | 90.6                          | Good               |
| Latvia                                   | 215                             | 4 088                            | 9 219                                | 97.2                                        | 98.6                                       | 91.0                                           | 89.8                          | Good               |
| Lithuania                                | 210                             | 4 223                            | 16 848                               | 99.1                                        | 99.5                                       | 97.1                                           | 96.6                          | Good               |
| Malta                                    | 48                              | 2 263                            | 3 265                                | 88.6                                        | 88.6                                       | 81.3                                           | 72.0                          | Good               |
| Montenegro                               | 126                             | 1 354                            | 2 186                                | 78.3                                        | 78.3                                       | 84.0                                           | 65.7                          | Fair               |
| Morocco                                  | 398                             | 6 112                            | 71 394                               | 99.7                                        | 100.0                                      | 98.3                                           | 98.3                          | Good               |
| Netherlands                              | 84                              | 1 271                            | 58 097                               | 37.6                                        | 56.4                                       | 73.7                                           | 41.5                          | Insufficient       |
| New Zealand                              | 97                              | 1 204                            | 24 847                               | 28.1                                        | 43.0                                       | 73.1                                           | 31.5                          | Insufficient       |
| North Macedonia                          | 202                             | 3 992                            | 7 322                                | 100.0                                       | 100.0                                      | 94.9                                           | 94.9                          | Good               |
| Norway                                   | 112                             | 1 528                            | 20 156                               | 34.1                                        | 53.9                                       | 73.1                                           | 39.4                          | Insufficient       |
| Poland                                   | 279                             | 3 783                            | 172 089                              | 93.6                                        | 99.6                                       | 94.7                                           | 94.4                          | Good               |
| Portugal                                 | 224                             | 3 511                            | 38 887                               | 98.7                                        | 99.1                                       | 92.2                                           | 91.4                          | Good               |
| Romania                                  | 216                             | 3 873                            | 64 851                               | 100.0                                       | 100.0                                      | 97.4                                           | 97.4                          | Good               |
| Saudi Arabia                             | 326                             | 3 306                            | 112 606                              | 98.1                                        | 98.1                                       | 94.6                                           | 92.8                          | Good               |
| Serbia                                   | 199                             | 4 007                            | 23 354                               | 98.5                                        | 99.5                                       | 95.6                                           | 95.2                          | Good               |

| Participating country/territory | Number of participating schools | Number of participating teachers | Estimated size of teacher population | School participation before replacement (%) | School participation after replacement (%) | Teacher participation in participating schools | Overall teacher participation | Recommended rating |
|---------------------------------|---------------------------------|----------------------------------|--------------------------------------|---------------------------------------------|--------------------------------------------|------------------------------------------------|-------------------------------|--------------------|
| Shanghai (China)                | 205                             | 4 078                            | 44 556                               | 100.0                                       | 100.0                                      | 98.4                                           | 98.4                          | Good               |
| Singapore                       | 156                             | 3 355                            | 10 601                               | 96.9                                        | 98.1                                       | 97.2                                           | 95.3                          | Good               |
| Slovak Republic                 | 242                             | 4 190                            | 22 949                               | 97.1                                        | 100.0                                      | 96.1                                           | 96.1                          | Good               |
| Slovenia                        | 222                             | 2 831                            | 8 269                                | 82.7                                        | 84.2                                       | 89.1                                           | 75.0                          | Good               |
| South Africa                    | 361                             | 3 301                            | 87 309                               | 92.8                                        | 93.3                                       | 91.2                                           | 85.0                          | Good               |
| Spain                           | 507                             | 9 098                            | 198 806                              | 99.8                                        | 100.0                                      | 94.1                                           | 94.1                          | Good               |
| Sweden                          | 196                             | 3 065                            | 33 858                               | 92.7                                        | 95.1                                       | 76.4                                           | 72.7                          | Fair               |
| Türkiye                         | 229                             | 4 932                            | 291 832                              | 99.6                                        | 99.6                                       | 97.2                                           | 96.8                          | Good               |
| United Arab Emirates            | 212                             | 4 369                            | 28 559                               | 99.5                                        | 99.5                                       | 98.4                                           | 97.9                          | Good               |
| United States <sup>4</sup>      | 154                             | 1 988                            | 1 206 856                            | 49.6                                        | 60.2                                       | 82.8                                           | 49.8                          | Poor               |
| Uzbekistan                      | 210                             | 4 431                            | 306 057                              | 100.0                                       | 100.0                                      | 98.7                                           | 98.7                          | Good               |
| Viet Nam                        | 202                             | 4 348                            | 305 410                              | 100.0                                       | 100.0                                      | 99.0                                           | 99.0                          | Good               |

Note: A school was deemed a participating school if at least 50% of the selected teachers returned their respective questionnaires with at least one question answered.

1. Belgium: Some sampled schools of the Flemish Community were located in the same places. The national centre advised these schools to distribute teachers between listing forms to avoid being selected multiple times. This deviation from the procedures could not be corrected for.
2. Flemish Community (Belgium): Some sampled schools were located in the same places. The national centre advised these schools to distribute teachers between listing forms to avoid being selected multiple times. This deviation from the procedures could not be corrected for.
3. Israel: Ultra-Orthodox schools were excluded after the survey administration due to very low participation rates. They are not considered in the participation rate but contribute to the exclusion rate.
4. United States: The national centre managed questionnaire delivery from their own servers using the platform provided by the IEA in a single participant setup. Following data collection, the United States assessed disclosure risk and applied related measures based on federal requirements (<https://nces.ed.gov/fcsm/dpt/>). No documentation of these measures was provided. The rating was defined as “poor” although the participation rate of schools before replacement did not completely reach 50%.

**Table 10.5. ISCED level 1: Principal participation and recommended ratings**

| Participating country/territory | Number of participating principals | Estimated size of school population | Principal participation before replacement (%) | Principal participation after replacement (%) | Recommended rating |
|---------------------------------|------------------------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------|--------------------|
| Australia                       | 178                                | 7 023                               | 63.0                                           | 85.6                                          | Fair               |
| Belgium                         | 333                                | 4 241                               | 61.1                                           | 81.0                                          | Fair               |
| Flemish Community (Belgium)     | 158                                | 2 417                               | 46.4                                           | 75.6                                          | Insufficient       |
| French Community (Belgium)      | 175                                | 1 824                               | 76.2                                           | 86.6                                          | Good               |
| Brazil                          | 284                                | 93 385                              | 84.1                                           | 93.2                                          | Good               |
| France                          | 322                                | 34 412                              | 91.9                                           | 93.3                                          | Good               |
| Japan                           | 202                                | 19 323                              | 87.4                                           | 98.1                                          | Good               |
| Korea                           | 198                                | 6 133                               | 66.1                                           | 88.4                                          | Fair               |
| Morocco                         | 389                                | 23 888                              | 98.7                                           | 98.7                                          | Good               |
| Netherlands                     | 132                                | 5 993                               | 43.8                                           | 68.3                                          | Insufficient       |
| New Zealand                     | 141                                | 2 044                               | 34.8                                           | 58.1                                          | Insufficient       |
| Saudi Arabia                    | 204                                | 12 267                              | 92.8                                           | 92.8                                          | Good               |
| Slovenia <sup>1</sup>           | 206                                | 443                                 | 77.1                                           | 78.8                                          | Good               |
| Spain                           | 487                                | 13 736                              | 97.2                                           | 97.2                                          | Good               |

| Participating country/territory | Number of participating principals | Estimated size of school population | Principal participation before replacement (%) | Principal participation after replacement (%) | Recommended rating |
|---------------------------------|------------------------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------|--------------------|
| Türkiye                         | 231                                | 16 361                              | 97.1                                           | 97.1                                          | Good               |
| United Arab Emirates            | 206                                | 789                                 | 99.6                                           | 99.6                                          | Good               |

Note: A school was deemed a participating school if the principal returned their questionnaire with at least one question answered.

1. Slovenia: The school sample was identical for ISCED levels 1 and 2. Principals were asked to participate in both questionnaires but did not in many cases. Eleven items were copied between ISCED levels in these cases.

**Table 10.6. ISCED level 1: Teacher participation and recommended ratings**

| Participating country/territory | Number of participating schools | Number of participating teachers | Estimated size of teacher population | School participation before replacement (%) | School participation after replacement (%) | Teacher participation in participating schools | Overall teacher participation | Recommended rating |
|---------------------------------|---------------------------------|----------------------------------|--------------------------------------|---------------------------------------------|--------------------------------------------|------------------------------------------------|-------------------------------|--------------------|
| Australia                       | 178                             | 3 003                            | 137 078                              | 63.0                                        | 85.6                                       | 89.9                                           | 76.9                          | Fair               |
| Belgium                         | 326                             | 4 913                            | 63 889                               | 59.9                                        | 79.3                                       | 84.2                                           | 66.8                          | Fair               |
| Flemish Community (Belgium)     | 146                             | 2 258                            | 38 107                               | 42.1                                        | 69.9                                       | 88.0                                           | 61.5                          | Insufficient       |
| French Community (Belgium)      | 180                             | 2 655                            | 25 783                               | 78.2                                        | 89.1                                       | 81.3                                           | 72.4                          | Good               |
| Brazil                          | 279                             | 2 994                            | 667 700                              | 81.0                                        | 90.9                                       | 97.4                                           | 88.5                          | Good               |
| France                          | 291                             | 1 993                            | 179 824                              | 89.1                                        | 91.2                                       | 88.9                                           | 81.1                          | Good               |
| Japan                           | 202                             | 3 356                            | 311 128                              | 87.4                                        | 98.1                                       | 97.9                                           | 96.0                          | Good               |
| Korea                           | 184                             | 3 124                            | 122 407                              | 60.3                                        | 82.1                                       | 90.6                                           | 74.4                          | Fair               |
| Morocco                         | 394                             | 4 905                            | 192 370                              | 100.0                                       | 100.0                                      | 99.1                                           | 99.1                          | Good               |
| Netherlands                     | 140                             | 1 305                            | 60 642                               | 46.9                                        | 72.2                                       | 85.3                                           | 61.6                          | Insufficient       |
| New Zealand                     | 130                             | 1 529                            | 21 009                               | 30.6                                        | 54.7                                       | 79.5                                           | 43.5                          | Insufficient       |
| Saudi Arabia                    | 218                             | 3 783                            | 213 117                              | 99.1                                        | 99.1                                       | 94.6                                           | 93.8                          | Good               |
| Slovenia                        | 220                             | 3 615                            | 12 379                               | 81.8                                        | 83.5                                       | 91.5                                           | 76.4                          | Good               |
| Spain                           | 500                             | 8 060                            | 201 862                              | 99.2                                        | 99.2                                       | 94.7                                           | 94.0                          | Good               |
| Türkiye                         | 232                             | 4 053                            | 205 969                              | 97.5                                        | 97.5                                       | 96.3                                           | 93.9                          | Good               |
| United Arab Emirates            | 206                             | 4 091                            | 25 817                               | 99.5                                        | 99.5                                       | 97.5                                           | 97.0                          | Good               |

Note: A school was deemed a participating school if at least 50% of the selected teachers returned their respective questionnaires with at least one question answered.

**Table 10.7. ISCED level 3: Principal participation and recommended ratings**

| Participating country/territory | Number of participating principals | Estimated size of school population | Principal participation before replacement (%) | Principal participation after replacement (%) | Recommended rating |
|---------------------------------|------------------------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------|--------------------|
| Croatia                         | 180                                | 381                                 | 90.0                                           | 90.0                                          | Good               |
| Denmark                         | 179                                | 610                                 | 54.4                                           | 77.1                                          | Fair               |
| Flemish Community (Belgium)     | 137                                | 744                                 | 47.6                                           | 65.2                                          | Insufficient       |
| Portugal                        | 203                                | 731                                 | 98.9                                           | 100.0                                         | Good               |
| Saudi Arabia                    | 214                                | 5 131                               | 92.5                                           | 92.5                                          | Good               |
| Slovenia <sup>1</sup>           | 104                                | 140                                 | 74.3                                           | 74.3                                          | Good               |
| Türkiye                         | 197                                | 10 741                              | 97.0                                           | 97.0                                          | Good               |
| United Arab Emirates            | 197                                | 629                                 | 98.3                                           | 98.3                                          | Good               |

Note: A school was deemed a participating school if the principal returned their questionnaire with at least one question answered.

1. Slovenia: The rating was defined as “good” although the participation rate of schools did not completely reach 75%.

**Table 10.8. ISCED level 3: Teacher participation and recommended ratings**

| Participating country/territory          | Number of participating schools | Number of participating teachers | Estimated size of teacher population | School participation before replacement (%) | School participation after replacement (%) | Teacher participation in participating schools | Overall teacher participation | Recommended rating |
|------------------------------------------|---------------------------------|----------------------------------|--------------------------------------|---------------------------------------------|--------------------------------------------|------------------------------------------------|-------------------------------|--------------------|
| Croatia                                  | 192                             | 3 497                            | 14 212                               | 96.0                                        | 96.0                                       | 85.7                                           | 82.3                          | Good               |
| Denmark                                  | 179                             | 2 550                            | 16 672                               | 58.3                                        | 79.3                                       | 86.1                                           | 68.3                          | Fair               |
| Flemish Community (Belgium) <sup>1</sup> | 141                             | 2 427                            | 47 252                               | 50.5                                        | 67.1                                       | 86.5                                           | 58.1                          | Poor               |
| Portugal                                 | 203                             | 3 878                            | 34 288                               | 99.6                                        | 100.0                                      | 93.9                                           | 93.9                          | Good               |
| Saudi Arabia                             | 226                             | 3 952                            | 107 791                              | 98.7                                        | 98.7                                       | 94.1                                           | 92.9                          | Good               |
| Slovenia                                 | 113                             | 2 717                            | 6 076                                | 80.7                                        | 80.7                                       | 83.4                                           | 67.4                          | Good               |
| Türkiye                                  | 201                             | 4 976                            | 287 877                              | 99.0                                        | 99.0                                       | 95.5                                           | 94.5                          | Good               |
| United Arab Emirates                     | 200                             | 4 228                            | 20 222                               | 99.5                                        | 99.5                                       | 98.8                                           | 98.3                          | Good               |

Note: A school was deemed a participating school if at least 50% of the selected teachers returned their respective questionnaires with at least one question answered.

1. Flemish Community (Belgium): Some sampled schools were located in the same places. The national centre advised these schools to distribute teachers between listing forms to avoid being selected multiple times. This deviation from the procedures could not be corrected for.

**Table 10.9. ISCED level 02: Leader participation and recommended ratings**

| Participating country/territory | Number of participating leaders | Estimated size of setting population | Leader participation before replacement (%) | Leader participation after replacement (%) | Recommended rating |
|---------------------------------|---------------------------------|--------------------------------------|---------------------------------------------|--------------------------------------------|--------------------|
| Chile                           | 160                             | 8 748                                | 78.6                                        | 88.3                                       | Good               |
| Colombia                        | 157                             | 75 191                               | 55.2                                        | 68.3                                       | Poor               |
| Denmark                         | 150                             | 3 378                                | 55.5                                        | 82.4                                       | Fair               |
| Finland                         | 204                             | 4 160                                | 92.4                                        | 97.1                                       | Good               |
| Flemish Community (Belgium)     | 158                             | 2 288                                | 62.7                                        | 83.2                                       | Fair               |
| Germany                         | 138                             | 50 860                               | 45.2                                        | 70.3                                       | Insufficient       |
| Ireland <sup>1</sup>            | 149                             | 3 950                                | 36.0                                        | 59.9                                       | Insufficient       |
| Israel <sup>2</sup>             | 285                             | 12 399                               | 86.1                                        | 92.2                                       | Good               |
| Japan                           | 189                             | 37 007                               | 71.4                                        | 95.0                                       | Fair               |
| Morocco                         | 429                             | 21 931                               | 93.3                                        | 98.3                                       | Good               |
| New Zealand <sup>3</sup>        | 38                              | -                                    | 19.7                                        | 22.9                                       | Insufficient       |
| Norway                          | 84                              | 4 929                                | 31.5                                        | 46.4                                       | Insufficient       |
| Spain                           | 481                             | 13 714                               | 98.2                                        | 98.2                                       | Good               |
| Sweden                          | 197                             | 12 467                               | 91.7                                        | 92.8                                       | Good               |
| Türkiye                         | 267                             | 23 809                               | 99.4                                        | 99.4                                       | Good               |

Note: A setting was deemed a participating setting if the leader returned their questionnaire with at least one question answered.

1. Ireland: Replacement settings were contacted before the participation of the originally sampled setting was defined. Consequently, replacements participated although the original setting participated as well. These replacements were moved into separate strata and were treated as self-representing. They do not contribute to participation rates.

2. Israel: Ultra-Orthodox settings were excluded after the survey administration due to very low participation rates. They are not considered in the participation rate but contribute to the exclusion rate.

3. New Zealand: Te Kōhanga Reo settings were excluded after the survey administration because no setting of this type participated. They are not considered in the participation rate but contribute to the exclusion rate. Due to low participation rates, a non-response adjustment was not implemented, and the estimated population size therefore remains unknown.

**Table 10.10. ISCED level 02: Staff participation and recommended ratings**

| Participating country/territory | Number of participating settings | Number of participating staff | Estimated size of staff population | Setting participation before replacement (%) | Setting participation after replacement (%) | Staff participation in participating settings | Overall staff participation | Recommended rating |
|---------------------------------|----------------------------------|-------------------------------|------------------------------------|----------------------------------------------|---------------------------------------------|-----------------------------------------------|-----------------------------|--------------------|
| Chile                           | 143                              | 741                           | 54 091                             | 70.7                                         | 79.5                                        | 88.0                                          | 70.0                        | Fair               |
| Colombia <sup>1</sup>           | 150                              | 553                           | 162 032                            | 55.3                                         | 65.2                                        | 97.7                                          | 63.6                        | Poor               |
| Denmark                         | 148                              | 946                           | 27 274                             | 54.9                                         | 81.3                                        | 89.5                                          | 72.8                        | Fair               |
| Finland                         | 204                              | 1 386                         | 42 851                             | 92.4                                         | 97.1                                        | 95.4                                          | 92.7                        | Good               |
| Flemish Community (Belgium)     | 164                              | 1 143                         | 21 469                             | 66.3                                         | 86.3                                        | 89.4                                          | 77.2                        | Fair               |
| Germany                         | 142                              | 810                           | 456 372                            | 47.2                                         | 72.1                                        | 82.2                                          | 59.3                        | Insufficient       |
| Ireland <sup>2</sup>            | 170                              | 690                           | 18 557                             | 41.6                                         | 69.5                                        | 73.9                                          | 51.4                        | Insufficient       |
| Israel <sup>3</sup>             | 291                              | 1 153                         | 42 272                             | 87.7                                         | 94.2                                        | 86.1                                          | 81.1                        | Good               |
| Japan                           | 189                              | 1 283                         | 317 235                            | 71.4                                         | 95.0                                        | 98.9                                          | 93.9                        | Fair               |
| Morocco                         | 428                              | 954                           | 48 583                             | 91.1                                         | 98.0                                        | 99.2                                          | 97.2                        | Good               |
| New Zealand <sup>4</sup>        | 35                               | 163                           | -                                  | 17.6                                         | 20.4                                        | 72.7                                          | 14.8                        | Insufficient       |
| Norway                          | 68                               | 377                           | 46 985                             | 25.5                                         | 37.6                                        | 73.8                                          | 27.8                        | Insufficient       |
| Spain                           | 489                              | 3 576                         | 121 268                            | 100.0                                        | 100.0                                       | 96.7                                          | 96.7                        | Good               |
| Sweden                          | 208                              | 1 219                         | 93 674                             | 97.0                                         | 98.0                                        | 86.2                                          | 84.5                        | Good               |
| Türkiye                         | 265                              | 1 289                         | 93 250                             | 97.8                                         | 97.8                                        | 98.4                                          | 96.2                        | Good               |

Note: A setting was deemed a participating setting if at least 33% of the selected staff returned their respective questionnaires with at least one question answered.

1. Colombia: Due to incomplete staff listing, the staff data of 11 settings were rejected. This includes cases where a combined questionnaire was used for leaders with staff duties. As the incomplete lists only affected the staff population, the combined questionnaires were not rejected in the leader dataset.

2. Ireland: Replacement settings were contacted before the participation of the originally sampled setting was defined. Consequently, replacements participated although the original setting participated as well. These replacements were moved into separate strata and were treated as self-representing. They do not contribute to participation rates.

3. Israel: Ultra-Orthodox settings were excluded after the survey administration due to very low participation rates. They are not considered in the participation rate but contribute to the exclusion rate.

4. New Zealand: Te Kōhanga Reo settings were excluded after the survey administration because no setting of this type participated. They are not considered in the participation rate but contribute to the exclusion rate. Due to low participation rates, a non-response adjustment was not implemented, and the estimated population size therefore remains unknown.

**Table 10.11. U3: Leader participation and recommended ratings**

| Participating country/territory          | Number of participating leaders | Estimated size of setting population | Leader participation before replacement (%) | Leader participation after replacement (%) | Recommended rating |
|------------------------------------------|---------------------------------|--------------------------------------|---------------------------------------------|--------------------------------------------|--------------------|
| Flemish Community (Belgium) <sup>1</sup> | 125                             | 5 327                                | 34.9                                        | 53.4                                       | Insufficient       |
| Germany <sup>2</sup>                     | 165                             | 46 847                               | 49.5                                        | 74.2                                       | Poor               |
| Ireland <sup>3</sup>                     | 183                             | 2 154                                | 39.6                                        | 59.5                                       | Insufficient       |
| Israel <sup>4</sup>                      | 289                             | 5 953                                | 77.2                                        | 85.5                                       | Good               |
| New Brunswick (Canada)                   | 84                              | 489                                  | 31.3                                        | 35.9                                       | Insufficient       |



| Participating country/territory | Number of participating leaders | Estimated size of setting population | Leader participation before replacement (%) | Leader participation after replacement (%) | Recommended rating |
|---------------------------------|---------------------------------|--------------------------------------|---------------------------------------------|--------------------------------------------|--------------------|
| New Zealand <sup>5</sup>        | 34                              | -                                    | 21.1                                        | 24.8                                       | Insufficient       |
| Norway                          | 76                              | 4 812                                | 28.0                                        | 40.9                                       | Insufficient       |
| Quebec (Canada)                 | 85                              | 10 317                               | 23.4                                        | 59.8                                       | Insufficient       |

Note: A setting was deemed a participating setting if the leader returned their questionnaire with at least one question answered.

U3: children under the age of three.

1. Flemish Community (Belgium): Settings without subsidy were excluded after the survey administration due to very low participation rates. They are not considered in the participation rate but contribute to the exclusion rate.

2. Germany: The rating was defined as “poor” although the participation rate before replacement did not completely reach 50%.

3. Ireland: Replacement settings were contacted before the participation of the originally sampled setting was defined. Consequently, replacements participated although the original setting participated as well. These replacements were moved into separate strata and were treated as self-representing. They do not contribute to participation rates.

4. Israel: Ultra-Orthodox settings were excluded after the survey administration due to very low participation rates. They are not considered in the participation rate but contribute to the exclusion rate.

5. New Zealand: Te Kōhanga Reo settings, free kindergartens and play centres were excluded after the survey administration because no setting of these types participated. They are not considered in the participation rate but contribute to the exclusion rate. Due to low participation rates, a non-response adjustment was not implemented, and the estimated population size therefore remains unknown.

**Table 10.12. U3: Staff participation and recommended ratings**

| Participating country/territory          | Number of participating settings | Number of participating staff | Estimated size of staff population | Setting participation before replacement (%) | Setting participation after replacement (%) | Staff participation in participating settings | Overall staff participation | Recommended rating |
|------------------------------------------|----------------------------------|-------------------------------|------------------------------------|----------------------------------------------|---------------------------------------------|-----------------------------------------------|-----------------------------|--------------------|
| Flemish Community (Belgium) <sup>1</sup> | 128                              | 499                           | 16 765                             | 35.8                                         | 55.3                                        | 83.6                                          | 46.2                        | Insufficient       |
| Germany                                  | 167                              | 876                           | 310 220                            | 50.5                                         | 76.0                                        | 87.8                                          | 66.7                        | Fair               |
| Ireland <sup>2</sup>                     | 207                              | 899                           | 11 865                             | 44.0                                         | 66.3                                        | 75.2                                          | 49.8                        | Insufficient       |
| Israel <sup>3</sup>                      | 297                              | 1 505                         | 25 597                             | 78.7                                         | 87.9                                        | 85.4                                          | 75.1                        | Good               |
| New Brunswick (Canada)                   | 88                               | 275                           | 2 345                              | 34.7                                         | 38.6                                        | 85.4                                          | 33.0                        | Insufficient       |
| New Zealand <sup>4</sup>                 | 33                               | 164                           | -                                  | 17.8                                         | 23.9                                        | 73.0                                          | 17.4                        | Insufficient       |
| Norway                                   | 68                               | 367                           | 41 262                             | 26.2                                         | 36.8                                        | 73.4                                          | 27.0                        | Insufficient       |
| Quebec (Canada)                          | 82                               | 311                           | 41 882                             | 23.3                                         | 49.7                                        | 75.0                                          | 37.3                        | Insufficient       |

Note: A setting was deemed a participating setting if at least 33% of the selected staff returned their respective questionnaires with at least one question answered.

1. Flemish Community (Belgium): Settings without subsidy were excluded after the survey administration due to very low participation rates. They are not considered in the participation rate but contribute to the exclusion rate.

2. Ireland: Replacement settings were contacted before the participation of the originally sampled setting was defined. Consequently, replacements participated although the original setting participated as well. These replacements were moved into separate strata and were treated as self-representing. They do not contribute to participation rates.

3. Israel: Ultra-Orthodox settings were excluded after the survey administration due to very low participation rates. They are not considered in the participation rate but contribute to the exclusion rate.

4. New Zealand: Te Kōhanga Reo settings, free kindergartens and play centres were excluded after the survey administration because no setting of these types participated. They are not considered in the participation rate but contribute to the exclusion rate. Due to low participation rates, a non-response adjustment was not implemented, and the estimated population size therefore remains unknown.

Table 10.13. TKS: Teacher participation and recommended ratings

| Participating country/territory | Number of participating schools | Number of participating teachers | Estimated size of teacher population | School participation before replacement (%) | School participation after replacement (%) | Teacher participation in participating schools | Overall teacher participation | Recommended rating |
|---------------------------------|---------------------------------|----------------------------------|--------------------------------------|---------------------------------------------|--------------------------------------------|------------------------------------------------|-------------------------------|--------------------|
| Chile                           | 341                             | 1 645                            | 59 136                               | 64.4                                        | 78.5                                       | 80.5                                           | 63.2                          | Fair               |
| Croatia                         | 262                             | 2 282                            | 16 182                               | 88.5                                        | 88.5                                       | 81.6                                           | 72.2                          | Good               |
| Morocco                         | 398                             | 4 584                            | 73 480                               | 99.7                                        | 100.0                                      | 98.5                                           | 98.5                          | Good               |
| Poland                          | 279                             | 2 831                            | 171 437                              | 93.6                                        | 99.6                                       | 94.8                                           | 94.4                          | Good               |
| Portugal                        | 224                             | 2 634                            | 39 447                               | 98.7                                        | 99.1                                       | 91.6                                           | 90.8                          | Good               |
| Saudi Arabia                    | 324                             | 2 435                            | 112 287                              | 98.6                                        | 98.6                                       | 93.4                                           | 92.1                          | Good               |
| South Africa                    | 359                             | 2 376                            | 85 677                               | 92.7                                        | 93.2                                       | 91.5                                           | 85.3                          | Good               |
| United States <sup>1</sup>      | 145                             | 1 362                            | 1 175 282                            | 46.5                                        | 56.6                                       | 79.7                                           | 45.1                          | Insufficient       |

Note: A school was deemed a participating school if at least 50% of the selected teachers returned their respective questionnaires with at least one question answered.

TKS: Teacher Knowledge Survey.

1. United States: The national centre managed questionnaire delivery from their own servers using the platform provided by the IEA in a single participant setup. Following data collection, the United States assessed disclosure risk and applied related measures based on federal requirements (<https://nces.ed.gov/fcsm/dpt/>). No documentation of these measures was provided.

## References

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# 11 Construction and validation of questionnaire scales

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The Teaching and Learning International Survey (TALIS) 2024 questionnaires are composed of sets of questions that are designed to be manifestations of a latent trait or construct. The primary objective of these item sets is to yield a single composite scale score that summarises the responses and indicates respondents' positions along the theoretical continuum of the latent trait. This chapter describes the steps taken to compute these scale scores and it illustrates the implications for analysis based on the characteristics and comparability of these scale scores. The chapter concludes presenting some of the limitations for cross-country/territory comparisons.

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## 11.1. Overview

The Teaching and Learning International Survey (TALIS) questionnaires include numerous items related to school, principal and teacher characteristics as well as their attitudes, perceptions and practices. The TALIS datasets include item-level survey data as well as additional indices and scale scores:

- Simple indices refer to variables created either by aggregating responses to ensure respondent anonymity (e.g. precise age data grouped into age categories) or by deriving new variables from existing ones through relational calculations (e.g. student-teacher ratios).
- Scale scores summarise responses to multiple items addressing the same latent construct. They were derived using latent variable modelling within the framework of confirmatory factor analysis (CFA).

CFA treats items as indicators of unobservable latent variables, such as self-efficacy or beliefs, and uses combinations of items to develop a measurement model of these latent constructs. After testing and confirming a well-fitting unidimensional latent model, scale scores may be estimated to serve as continuous values for the latent constructs. While simple indices enhance the analysis of observable (manifest) characteristics, such as student-teacher ratios, scale scores enable analysis of non-observable (latent) characteristics such as attitudes or other personal traits. They both rely on measurement assumptions, with the difference that the assumptions of manifest variables cannot be tested in the way that those of latent variables can.

This chapter begins by listing the specific simple indices (e.g. ratios, averages and binary indicators) and their computation. Afterwards, it outlines the procedures used to perform CFA scale evaluation and scale score estimation. It finally describes the scales, including the items used to compose each scale, the results of scale evaluation and the parameters used to compute scale scores. These descriptions are grouped by TALIS components and start with indices and scales included in the TALIS core survey (including International Standard Classification of Education (ISCED) levels 1, 2 and 3); the ones included in the Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) are then presented (for ISCED level 02 and children under the age of three [U3]) and, finally, scales from the TALIS Teacher Knowledge Survey (TKS) are described.

## 11.2. Simple indices

A range of *simple indices*, i.e. measures derived from simple deterministic transformations rather than latent trait analyses based on factor-analytical approaches, as well as *derived variables* used during reporting or intended to capture important information in a grouped/coarsened way that would otherwise be suppressed from public-use data, were added to the dataset.

The names, labels and logic for computing these indices or deriving variables are stated below, separately for the TALIS core survey (covering the TKS where identical questions were used) and TALIS Starting Strong.

The handling of missing data in single source variables was mostly straightforward. In cases of multiple source variables where the values were consistently “Not administered” or consistently “Omitted or invalid”, the derived index or variable was coded to match this type of missingness. The descriptions below describe exceptions to this general handling where applicable, e.g. where a derived variable was computed or not if responses were only partially available or responses did not allow for certain transformations like the division by zero in ratios.

### 11.2.1. TALIS Core Survey/Teacher Knowledge Survey (as applicable)

#### *Principal/school level*

##### **Principal's age (grouped) (T4PAGEGR)**

The principal's age in variable TC4G02 was grouped into four categories: 1 = Under 40 years old, 2 = 40-49, 3 = 50-59, and 4 = 60 or above.

##### **Principal's highest level of formal education completed (grouped) (T4PHEDAT)**

The principal's highest level of formal education completed was calculated by using the responses in variable TC4G03, recoded into five categories: 1 = Below ISCED level 5, 2 = ISCED level 5, 3 = ISCED level 6, 4 = ISCED level 7, and 5 = ISCED level 8.

##### **Principal's years of work experience at current school (grouped) (T4PYEXPPS)**

This variable was derived from responses in variable TC4G04A, which asked about the principal's work experience at their current school in years. A grouped variable was created with four categories: 1 = Less than or equal to 5 years, 2 = 6 to 10 years, 3 = 11 to 20 years, and 4 = Above 20 years.

##### **Principal's years of work experience in total (grouped) (T4PYEXPPT)**

Responses in variable TC4G04B were grouped into four categories: 1 = Less than or equal to 5 years, 2 = 6 to 10 years, 3 = 11 to 20 years, and 4 = Above 20 years.

##### **Principal's years of work experience in school management (grouped) (T4PYEXPSM)**

Responses in variable TC4G04C were grouped into four categories: 1 = Less than or equal to 5 years, 2 = 6 to 10 years, 3 = 11 to 20 years, and 4 = Above 20 years.

##### **Principal's years of work experience as teacher (grouped) (T4PYEXPT)**

Responses in variable TC4G04D were grouped into four categories: 1 = Less than or equal to 5 years, 2 = 6 to 10 years, 3 = 11 to 20 years, and 4 = Above 20 years.

##### **Principal's years of work experience in other non-education roles (grouped) (T4PYEXPO)**

Responses in variable TC4G04E were grouped into four categories: 1 = Less than or equal to 5 years, 2 = 6 to 10 years, 3 = 11 to 20 years, and 4 = Above 20 years.

##### **Principal's employment status in terms of working hours (grouped) (T4PEMPWH)**

The four levels of working hours in variable TC4G06 were further grouped into: 1 = Full-time/more than 90% of full-time hours, and 2 = Part-time/90% of full-time hours or less.

##### **School location (grouped) (T4SCHLOC)**

The school location variable was constructed from responses in variable TC4G11 regarding the size of the community where the school is located. To coarsen the variable, the following three categories were derived: 1 = Rural (up to 3 000 people), 2 = Town (3 001 to 100 000 people), and 3 = City (more than 100 000 people).

### **Number of teachers (grouped) (T4NUMTCH)**

The grouped number of teachers variable was derived from responses in variable TC4G14A using five categories: 1 = Fewer than 25 teachers, 2 = 25 to 49 teachers, 3 = 50 to 74 teachers, 4 = 75 to 99 teachers, and 5 = 100 or more teachers.

### **Student to teacher ratio (T4STRATIO)**

The student-teacher ratio was calculated at the school level based on the principal's responses about the number of currently employed teachers in variable TC4G14A and the total number of enrolled students across all grades in variable TC4G17. The ratio is computed by dividing the total number of students by the number of teachers, provided that both values are greater than zero.

### **Teacher to pedagogical support personnel ratio (T4TPRATIO)**

The teacher-pedagogical support personal ratio was calculated at the school level based on the principal's responses about the number of currently employed support personnel in variable TC4G14B and the total number of teachers in variable TC4G14A. The ratio was derived by dividing the number of teachers by the number of pedagogical support personnel in a given school, provided that both are greater than zero.

### **Teacher to administrative or management personnel ratio (T4TARATIO)**

The teacher-administrative or management personnel ratio was calculated at the school level based on the principal's responses about the number of currently employed administrative staff (variable TC4G14C), the number of management personnel (variable TC4G14D) and the total number of teachers (variable TC4G14A). The ratio was derived by dividing the total number of teachers by the sum of the number administrative and management personnel in a given school, provided that both the numerator and denominator are greater than zero.

### **Teacher to new teacher ratio (T4TTNRATIO)**

This ratio was calculated using responses in variable TC4G15A about the number of newly hired teachers in the last 12 months and in variable TC4G14A about the total number of teachers. The ratio was computed as the total number of teachers divided by the number of new teachers, provided both values are greater than zero.

### **Teacher to left teacher ratio (T4TTLRATIO)**

The variable was derived from variable TC4G15B about the number of teachers who left the school permanently in the last 12 months and from variable TC4G14A about the total number of teachers. The ratio was computed by dividing the total number of teachers by the number of teachers who left the school, conditional on both being greater than zero.

### **Teacher to absent teacher ratio (T4TTARATIO)**

This variable was calculated using responses in variable TC4G15C about the number of teachers absent or unavailable on the most recent Tuesday school was in session and in variable TC4G14A about the total number of teachers. The ratio was computed as the total number of teachers divided by the number of absent teachers, where both values were greater than zero.

### Number of ISCED levels taught in the school (T4SCHISCN)

The number of ISCED levels offered in the school was determined using responses from variables TC4G16A through F. A binary, zero-based variable was created with codes: 0 = One ISCED level, and 1 = More than one ISCED level.

### Number of programmes taught in the school (T4SCHPRGN)

The number of programmes taught based on variables TC4G16A through F was grouped into two zero-based categories: 0 = One track (either general or vocational), and 1 = More than one track (general and vocational).

### Number of enrolled students (grouped) (T4NUMSTUD)

The grouped number of enrolled students was calculated using the principal's responses about the current school enrolment in variable TC4G17. The values were recoded into three categories: 1 = Fewer than 250 students, 2 = 250-749 students, and 3 = 750 students and above.

### School autonomy indices (T4PAUTS/T4PAUTB/T4PAUTP/T4PAUTI/T4PAUTC/T4PAUTD)

In addition to scale scores developed through CFA, indices for school resources and school autonomy were created using recoding of the frequencies of the items, as CFA models were not appropriate for the measured items comprising these indices.

To describe the extent of school autonomy in decision making, six simple indices were derived from questions 24 and 25 of the school principal questionnaire:

- school autonomy for staffing (T4PAUTS)
- school autonomy for budgeting (T4PAUTB)
- school autonomy for educational policies (T4PAUTP)
- school autonomy for instructional policies (T4PAUTI)
- school autonomy for curriculum (T4PAUTC)
- school autonomy for diversity policies (T4PAUTD).

Table 11.1 presents the corresponding items for all school autonomy indices.

**Table 11.1. Items included in school autonomy simple indices (T4PAUTS, T4PAUTB, T4PAUTP, T4PAUTI, T4PAUTC, T4PAUTD)**

| Simple index and variables                               | Item wording                                                                        |
|----------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>T4PAUTS: School autonomy for staffing</b>             |                                                                                     |
| TC4G24A1 – TC4G24A5                                      | Appointing or hiring teachers                                                       |
| TC4G24B1 – TC4G24B5                                      | Dismissing or suspending teachers from employment                                   |
| <b>T4PAUTB: School autonomy for budgeting</b>            |                                                                                     |
| TC4G24C1 – TC4G24C5                                      | Establishing teachers' starting salaries, including setting pay scales              |
| TC4G24D1 – TC4G24D5                                      | Determining teachers' salary increases                                              |
| TC4G24E1 – TC4G24E5                                      | Deciding on budget allocations within the school                                    |
| <b>T4PAUTP: School autonomy for educational policies</b> |                                                                                     |
| TC4G24F1 – TC4G24F5                                      | Establishing student disciplinary policies and procedures                           |
| TC4G24G1 – TC4G24G5                                      | Establishing student assessment policies, including <national/regional> assessments |



| Simple index and variables                                 | Item wording                                                                        |
|------------------------------------------------------------|-------------------------------------------------------------------------------------|
| TC4G24H1 – TC4G24H5                                        | Approving students for admission to the school                                      |
| <b>T4PAUTI: School autonomy for instructional policies</b> |                                                                                     |
| TC4G24F1 – TC4G24F5                                        | Establishing student disciplinary policies and procedures                           |
| TC4G24G1 – TC4G24G5                                        | Establishing student assessment policies, including <national/regional> assessments |
| TC4G24J1 – TC4G24J5                                        | Determining course content, including <national/regional> curricula                 |
| TC4G24K1 – TC4G24K5                                        | Deciding which courses are offered                                                  |
| <b>T4PAUTC: School autonomy for curriculum</b>             |                                                                                     |
| TC4G24I1 – TC4G24I5                                        | Choosing which learning materials are used                                          |
| TC4G24J1 – TC4G24J5                                        | Determining course content, including <national/regional> curricula                 |
| TC4G24K1 – TC4G24K5                                        | Deciding which courses are offered                                                  |
| <b>T4PAUTD: School autonomy for diversity policies</b>     |                                                                                     |
| TC4G25C1 – TC4G25C5                                        | Determining policies on student diversity                                           |
| TC4G25D1 – TC4G25D5                                        | Determining policies on teacher diversity                                           |

School autonomy indices were created using a total of 13 items, each of which had 5 response options. School principals had to indicate who, among a range of stakeholders, had a considerable responsibility in making decisions relating to tasks listed in the questionnaire. Considerable responsibility could be attributed to one or more of the following:

- principal
- other members of the <school management team>
- teachers (not as part of the <school management team>)
- <school governing board>
- <local, municipality/regional, state, or national/federal> authorities.

For a particular task, the extent of school-level autonomy was determined by whether considerable responsibility lay at the school level (i.e. with the principal, other members of the <school management team>, teachers [not as a part of the <school management team>] or the <school governing board>), with other authorities (i.e. <local, municipality/regional, state, or national/federal>) or was shared by both groups. Each response option (“Checked”, “Not checked”) was a variable of its own.

The indices were computed in the following way:

- A new variable for each item was created (each item had five response options, one for each decision maker). If at least one of the response options was checked, the variable was coded as 0.
- If, for a given item, none of the first four response options (describing decision making as being at the school level) were checked and the fifth response option (indicating decision making being the responsibility of other authorities) was checked, then the new variable was coded as -1. Thus, if the principal checked only the “Local, municipality/regional, state, or national/federal> authorities” response option, the task was considered to be an external responsibility (not autonomous).
- If the school principal checked response options from both groups (decision making at the school level and decision making by other authorities), the responsibility was considered to be shared, and the value remained 0 (see point 1).
- If one of the first four response options (the decision making being at the school level) was checked, and the fifth response option (decision making being other authority responsibility) was not checked, the new variable was coded as +1. Therefore, if the principal selected at least one of the

four school-level responsibility options and no other authority responsibility option, the task was considered to be a school responsibility (autonomous).

- The newly created variables were recoded: -1 was recoded to 1, 0 to 2, +1 to 3.
- For each index, if more than half of the newly created variables were classified as autonomous, the school was classified as autonomous. If more than half of the corresponding tasks were classified as not autonomous, the school was classified as not autonomous. If neither criterion was met, the school was classified as mixed. The final indices were coded 1 for “No autonomy”, 2 for “Mixed autonomy”, and 3 for “Autonomy”.

### School resources indices (T4PLACP/T4PLACSNP/T4PLACMR)

To describe the level of resources available in schools, three simple indices were derived from ten items in question 39<sup>1</sup> of the principal questionnaire. The question asked school principals to indicate the extent (“Not at all”, “To some extent”, “Quite a bit”, “A lot”) to which a shortage or lack of resources in a range of areas hindered the school’s capacity to provide quality instruction.

Table 11.2 presents the corresponding items for the three indices: lack of pedagogical personnel (T4PLACP), lack of specific needs pedagogical personnel (T4PLACSNP) and lack of material resources (T4PLACMR).

**Table 11.2. Items included in school resources simple indices (T4PLACP, T4PLACSNP, T4PLACMR)**

| Simple index and variables                                     | Item wording                                                                                                                  |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>T4PLACP: Lack of pedagogical personnel</b>                  |                                                                                                                               |
| TC4G40A                                                        | Shortage of qualified teachers                                                                                                |
| TC4G40B                                                        | Shortage of teachers with competence in teaching students with special education needs                                        |
| TC4G40C                                                        | Shortage of vocational teachers                                                                                               |
| TC4G40K                                                        | Shortage of teachers with competence in teaching students in a multicultural or multilingual setting                          |
| TC4G40L                                                        | Shortage of teachers with competence in teaching students from <socio-economically disadvantaged homes>                       |
| <b>T4PLACSNP: Lack of specific needs pedagogical personnel</b> |                                                                                                                               |
| TC4G40B                                                        | Shortage of teachers with competence in teaching students with special education needs                                        |
| TC4G40K                                                        | Shortage of teachers with competence in teaching students in a multicultural or multilingual setting                          |
| TC4G40L                                                        | Shortage of teachers with competence in teaching students from <socio-economically disadvantaged homes>                       |
| <b>T4PLACMR: Lack of material resources</b>                    |                                                                                                                               |
| TC4G40D                                                        | Shortage or inadequacy of instructional materials (e.g. textbooks)                                                            |
| TC4G40E                                                        | Shortage or inadequacy of <digital resources and tools> for instruction                                                       |
| TC4G40F                                                        | Insufficient Internet access                                                                                                  |
| TC4G40G                                                        | Shortage or inadequacy of library materials                                                                                   |
| TC4G40I                                                        | Shortage or inadequacy of instructional space (e.g. classrooms)                                                               |
| TC4G40J                                                        | Shortage or inadequacy of physical infrastructure (e.g. classroom furniture, school buildings, heating/cooling, and lighting) |
| TC4G40M                                                        | Shortage or inadequacy of necessary materials to train vocational skills                                                      |

The indices were computed in the following way:

- If all responses to the items included in the particular index were “Not at all” or “To some extent”, the index received a value of 1 = Not a problem.

- If all responses to the component variables for the particular index were “Quite a bit” or “A lot”, the index received a value of 3 = A problem.
- All other combinations were coded as 2 = A bit of a problem.
- The final indices are coded as: 1 for “Not a problem”, 2 for “A bit of a problem”, and 3 for “A problem”.

### *Teacher level*

#### **Teacher’s age (grouped) (T4TAGEGR)**

The teacher’s age group variable was derived from teachers’ responses to the question about their age in variable TT4G02. It was created by recoding the original responses into five age bands: 1 = Under 29 years old, 2 = 30-39, 3 = 40-49, 4 = 50-59, and 5 = 60 or above.

#### **Teacher’s highest level of formal education completed (grouped) (T4THEDAT)**

This variable was constructed using responses in the variable TT4G03 regarding the highest level of formal education completed by teachers by grouping these into five categories: 1 = Below ISCED level 5, 2 = ISCED level 5, 3 = ISCED level 6, 4 = ISCED level 7, and 5 = ISCED level 8.

#### **Year of completion of first teaching qualification (grouped) (T4TYQUAL)**

This variable was derived from teacher responses in variable TT4G05 about the year in which they completed their first teaching qualification, grouped into nine time periods: 1 = 1940-49, 2 = 1950-59, 3 = 1960-69, 4 = 1970-79, 5 = 1980-89, 6 = 1990-99, 7 = 2000-09, 8 = 2010-19, and 9 = 2020-24.

#### **Number of schools teacher works at (T4TNSCH)**

The variable indicating the number of schools a teacher works at was derived from variables TT4G10 and TT4G11 by categorising the responses into three groups: 0 = Not working in other schools, 1 = Working in one other school, 2 = Working in two or more other schools.

#### **Teacher’s employment status in terms of working hours (grouped) (T4TEMPWH)**

This variable was derived from responses in variable TT4G12 and captures the teacher’s employment status based on their reported working hours. The grouped variable was created with two categories: 1 = Full-time (more than 90% of full-time hours), and 2 = Part-time (90% of full-time hours or less).

#### **Teacher’s years of work experience at current school (grouped) (T4TYEXPTS)**

This variable was derived from responses in variable TT4G13A concerning the number of years a teacher has worked at the current (sampled) school. The grouped variable has four categories: 1 = Less than or equal to 5 years, 2 = 6-10 years, 3 = 11-20 years, and 4 = Above 20 years.

#### **Teacher’s years of work experience in total (grouped) (T4TYEXPTT)**

The total number of years a teacher has worked in the profession was obtained from responses in variable TT4G13B by classifying responses into four categories: 1 = Less than or equal to 5 years, 2 = 6-10 years, 3 = 11-20 years, and 4 = Above 20 years.

### **Teacher's years of work experience in other education roles (grouped) (T4TYEXPE)**

This variable was derived from teachers' responses in variable TT4G13C regarding their work experience in roles outside of classroom teaching but within the education sector. The grouped variable has four categories: 1 = Less than or equal to 5 years, 2 = 6-10 years, 3 = 11-20 years, and 4 = Above 20 years.

### **Teacher's years of work experience in other non-education roles (grouped) (T4TYEXPO)**

Responses in variable TT4G13D measuring teachers' experience in roles outside the education sector, was likewise grouped into four categories: 1 = Less than or equal to 5 years, 2 = 6-10 years, 3 = 11-20 years, and 4 = Above 20 years.

### **Nominal list of languages used by teacher (multilingualism) (T4TLANG)**

The list of languages used by a teacher was derived through processing responses to the closed and open responses in variable TT4G29A-G (or where applicable nationally extended response options). The resulting variable is a nominal list that alphabetically records the languages reported to be regularly used by the teacher, coded against the ISO 639-2 standard.

### **Multilingualism (T4TLANGN)**

The derived multilingualism variable was generated based on the above mentioned T4TLANG variable. The variable represents the number of languages used by a teacher: 1 = One language (monolingual), 2 = Two languages (bilingual), and 3 = Three or more languages (multilingual).

### **Target class size (grouped) (T4TCSIZE)**

The grouped target class size was derived from teachers' responses to variable TT4G46 by recoding the original responses into four class size bands: 1 = Fewer than 15, 2 = 15-24, 3 = 25-34, and 4 = 35 or above.

### **Index of methods of assessing student learning (T4FASPR)**

To describe the frequency of use of assessment methods, an index was derived from variables TT4G53C, D and E, where teachers indicated the frequency ("Never or almost never", "Occasionally", "Frequently", "Always") with which they are providing oral or written feedback to indicate areas or improvement (TT4G53C), asking students to assess their own progress (TT4G53D) and observing students when working on particular tasks and providing immediate feedback (TT4G53E).

The index was computed in the following way:

- The responses are recoded to 0 ("Never or almost never"), 1 ("Occasionally"), 2 ("Frequently"), 3 ("Always").
- A simple sum with 0-9 as possible values was computed. If any of the variables had an "Omitted or invalid" value, T4FASPR was set to omitted/invalid, i.e. it was only computed if all three responses were available.

### **Index of classroom infrastructure quality (T4CLSINF)**

To describe the level of classroom infrastructure quality, a simple index was derived from variables TT4G59A-F, items which asked teachers to indicate the extent ("Not at all", "To some extent", "Quite a bit", "A lot") to which their capacity to provide quality instruction in the target class was hindered by various infrastructure features of the target class.

The index was computed in the following way:

- If all responses to all items were “Not at all” or “To some extent”, the index received a value of 1 = Not a problem.
- If all responses to all six items were “Quite a bit” or “A lot”, the index received a value of 3 = A problem.
- All other combinations were coded as 2 = A bit of a problem.

The final index is coded as: 1 for “Not a problem”, 2 for “A bit of a problem”, and 3 for “A problem”.

#### **Teacher’s single most important recommendation to stakeholders or policy makers (T4TPOLREC)**

The variable captured a teacher’s single most important recommendation to stakeholders or policy makers, derived from responses in variable TT4G81 and subsequent translation, correction and vetting to ensure accuracy and consistency in close collaboration with national centres.

### **11.2.2. TALIS Starting Strong**

#### *Leader/setting level*

#### **Leader’s age (grouped) (S2LAGEGR)**

The grouped leader age variable was derived from leaders’ responses to the question about their age (SL2G02). A new variable was created by recoding the original responses into three age bands: 1 = Under age 30, 2 = Between ages 30 and 49, and 3 = Age 50 and older.

#### **Leader’s education (grouped) (S2LISCED)**

This variable dichotomised early childhood education and care (ECEC) leaders according to the highest level of formal education they have completed, based on responses to SL2G03, with categories: 1 = ISCED 2011 level 5 and below, 2 = ISCED 2011 level 6 and above.

#### **Training in early childhood, financial or human resource management, or pedagogical leadership (S2LTRAIN)**

The variable identified whether the education or training completed by ECEC setting leaders included key topics related to early childhood development, management or pedagogical leadership. It was constructed using responses to SL2G04A-D, which asked whether the respondent’s education or training covered the following areas: early childhood development, well-being and learning, financial management, human resource management and pedagogical leadership. This variable was coded into the following categories: 0 = No training in any of the following topics, 1 = Training in at least one of these topics.

If any of SL2G04A-D were marked as “Yes”, the variable was coded as 1, indicating training in at least one topic. If all responses were “No”, the variable was coded as zero, indicating no training in any of the topics. If responses were “No” with some missing data, the variable was coded as “Omitted or Invalid”.

#### **Leader’s experience (grouped) (S2LEXPGR)**

The variable categorised ECEC setting leaders based on their total years of experience working as a centre leader. It was constructed using responses to SL2G05B, which asked leaders to report their overall duration in this role, with categories: 1 = 3 years or less, 2 = Between 4 and 9 years, and 3 = 10 years or more.

### **Sources of ECEC funding (SL2G18A\_R-SL2G18D\_R)**

To capture the range of funding sources for ECEC settings, a set of variables was constructed using responses to the original variables SL2G18A-D. These variables asked whether the setting received funding from specific sources during the past 12 months. Respondents were instructed to select one of three response options for each source: “Yes”, “No”, or “Do not know”. The funding sources included direct payments from government entities at any level; fees or charges paid directly or indirectly by parents or guardians; direct payments from employers of parents or guardians; and other non-governmental funding sources, such as funding from religious institutions, donations, fundraising by parents or guardians, or subsidies through non-profit ECEC providers.

For analysis, responses were recoded as follows: a response of “Yes” was assigned a value of 1, “No” was assigned a value of 2, and “Do not know” was treated as valid missing code.

### **Publicly or privately managed ECEC settings: for-profit or non-profit (S2SMANPRF)**

To describe the financial and human resource management structures of ECEC settings, a variable was constructed based on responses from the leader questionnaire. This index was derived from two items: SL2G19 and SL2G21.

- SL2G19 asks the ECEC setting leader to indicate whether the setting is publicly or privately managed.
- SL2G21 asks the leader to specify whether the institution operates on a for-profit or non-profit basis.

Based on these responses, the index was coded as follows:

- A value of 1 was assigned when the setting is publicly managed.
- A value of 2 was assigned when the setting is privately managed and operates on a for-profit basis, or if SL2G19 was missing and SL2G21 indicated operating on a for-profit basis.
- A value of 3 was assigned when the setting is privately managed and operates on a non-profit basis.
- A value of “Omitted” was assigned when the SL2G19 was missing and SL2G21 indicated working on a non-profit basis. Likewise, a value of “Omitted” was assigned in cases that indicated they were privately managed in SL2G19 and SL2G21 was missing a response.

### **Sum of all staff members (S2SUMSTAFF)**

To determine the total number of staff members working in each ECEC setting, a composite variable was created based on responses in variables SL2G22A-D, which asked for the number of individuals working with children in ISCED-2011 level 02 or below at this ECEC setting, grouped by role:

- SL2G22A: <ECEC setting leaders>
- SL2G22B: <Teachers>
- SL2G22C: <Assistants>
- SL2G22D: Other <ECEC staff>.

This sum was computed if at least one of the four items was answered. If any of SL2G22A-D was missing, the missing value was treated as zero in the summation.

### **Sum of all staff members (grouped) (S2SUMSTAFFGR)**

This variable grouped the responses of S2SUMSTAFF into four categories: 1 = 5 staff or fewer, 2 = Between 6 and 10 staff; 3 = Between 11 and 20 staff, and 4 = 21 staff or more.

### **Proportion of staff who left permanently in the last 12 months (S2LSTAFFLEFT)**

This variable calculated the proportion of staff who permanently left this ECEC setting in the last 12 months. This was created by dividing SL2G23B by S2SUMSTAFF, provided S2SUMSTAFF is greater than zero, and assigning the following categories: 1 = Less than 10%, 2 = 10% or more.

### **Setting size (national tertiles) (S2SSIZGR)**

The variable categorised ECEC settings into national tertiles based on the number of children enrolled in the relevant level of ECEC (i.e. ISCED level 02 or settings for children under the age of 3), as recorded in SL2G25. The tertiles were based on estimated integer values and all observations with the same estimated value are grouped into the same bin, typically the lower category, leading to groups with an unequal number and weighted proportion of observations in each. Non-missing values in the variable SL2G25 were used to allocate cases to the following tertile categories: 1 = lowest (1st) national tertile of setting size, 2 = 2nd national tertile of setting size, and 3 = highest (3rd) national tertile of setting size. Cases with missing information in SL2G25 were coded as “Omitted or invalid”. Due to a large number of settings with low number of children enrolled, the tertiles were adjusted for Québec (Canada).

### **Proportion of children with specific characteristics in ECEC settings (S2SPCTU3/S2SPCT3O/S2SPCTLNG/S2SPCTSEN/S2SPCTDIS/S2SPCTMIG/S2SPCTREF/ S2SPCTMIN)**

To describe the composition of children in ECEC settings, a set of grouped proportions was created to categorise the percentage of children with specific characteristics. These categories were based on responses in variables SL2G25 and SL2G27A-H.

- SL2G25 asked for the total number of children currently enrolled in the ECEC setting.
- SL2G27A-H asked for the number of children in each of the following categories:
  - A: Under the age of 3
  - B: Age 3 and older
  - C: Whose first language is different
  - D: With special education needs
  - E: From socio-economically disadvantaged homes
  - F: Who are immigrants or with migrant backgrounds
  - G: Who are refugees
  - H: Who are belonging to ethnic/national minorities.

Respondents were instructed to enter a number for each category and to use zero if none. Because children may belong to multiple categories, these reported counts may overlap.

Each of the eight proportions were calculated using the same logic:

- If SL2G25 had no response, the index was assigned a value of “Omitted or invalid”.
- If the reported number of children for a given category was zero, the index was assigned a value of 1.
- If the number was greater than zero but represented less than 10% of the total enrolment, the index was assigned a value of 2.
- If the proportion of children in the category was between 10 and 50% of the total enrolment, the index was assigned a value of 3.
- If the proportion exceeded 50%, the index was assigned a value of 4.



### **Proportion of children in this ECEC setting whose first language is different (S2SPRPLNG)**

This grouped variable collapsed the values in S2SPCTLNG into two categories: 1 = Less than 10%, 2 = 10% or more.

### **Proportion of children in this ECEC setting with special education needs (S2SPRPSEN)**

This grouped variable collapsed the responses of S2SPCTSEN into two categories: 1 = Less than 10%, 2 = 10% or more.

### **Proportion of children in this ECEC setting from socio-economically disadvantaged homes (S2SPRPDIS)**

This grouped variable collapsed the responses of S2SPCTDIS into two categories: 1 = Less than 10%, 2 = 10% or more.

### **Proportion of children in this ECEC setting who are immigrants or with migrant backgrounds (S2SPRPMIG)**

This group variable collapsed the responses of S2SPCTMIG into two categories: 1 = Less than 10%, 2 = 10% or more.

### **Proportion of children in this ECEC setting who are refugees (S2SPRPREF)**

This group variable collapsed the responses of S2SPCTREF into two categories: 1 = Less than 10%, 2 = 10% or more.

### **Proportion of children in this ECEC setting belonging to ethnic/national minorities (S2SPRPMIN)**

This group variable collapsed the responses of S2SPCTMIN into two categories: 1 = Less than 10%, 2 = 10% or more.

### **Reasons for unmet enrolment demand (SL2G26A\_R-SL2G26E\_R)**

To assess whether there were children who wanted to enrol at an ECEC setting but were unable to do so because there were no available places, a set of variables was constructed using responses to SL2G26A-E. These asked respondents to indicate whether such cases occurred in the last 12 months and to specify the circumstances:

- A: Yes, children were placed on a waiting list and later enrolled
- B: Yes, children were placed on a waiting list and are still waiting for a place
- C: Yes, but children were not placed on a waiting list
- D: No
- E: I do not have this information.

Respondents could select more than one option. Cases where contradictory options (e.g. “Yes, children were placed on a waiting list and are still waiting for a place” [B] and “I do not have this information” [E]) were selected simultaneously were marked invalid.

For analysis, responses from each variable SL2G26A-SL2G26E were recoded into two categories for new variables SL2G26A\_R-SL2G26E\_R: “Checked”, and “Not checked”. Each individual variable was recoded based on the selection of answers across the source variables. When only one variable was marked as “Checked”, all others should be marked as “Not checked”. This is applicable in all cases except for a

combination of “Checked” in SL2G26B and SL2G26C. In these cases, SL2G26B\_R and SL2G26C\_R retain a value of “Checked” in both variables. In cases where answers were contradictory, the response was marked as “Omitted or invalid”, such as the example above for items B and E. Responses marked as “Not applicable” were recoded as a valid missing value.

### **Physical environment conditions (SL2G28A\_R-SL2G28H\_R)**

To assess the quality of the physical environment in ECEC settings, a set of variables was created based on responses to question SL2G28A-H. This question asked respondents to indicate their level of agreement with a series of eight statements describing the adequacy and condition of physical spaces within the setting. Responses were provided on a four-point scale: “Strongly disagree”, “Disagree”, “Agree”, and “Strongly agree”, along with a “Not applicable” option.

The statements addressed the following aspects of the setting:

- A: Adequate ventilation for healthy airflow
- B: Sufficient furniture for each child (e.g. chairs, tables)
- C: Indoor space arranged to allow children to move around freely
- D: Background noise levels that do not interfere with interactions
- E: Roof, ceiling, walls and floor in good condition (e.g. no leaks or mould)
- F: Easy access to bathrooms for children
- G: Outdoor space arranged to support free movement
- H: Availability of shaded areas in the outdoor space.

For analysis, responses were recoded such that “Strongly disagree” was coded as 1, “Disagree” as 2, “Agree” as 3, “Strongly agree” as 4, and “Not applicable” was treated as a valid missing code.

### **Sum of available induction/orientation activities (S2SNINAC)**

To measure the availability of induction or orientation activities in ECEC settings, an index was created based on responses to variables SL2G29A-J. This question asked whether various types of induction or orientation activities are available for new ECEC staff or setting leaders, activities intended to support individuals who are either new to the profession or new to the specific setting.

Respondents were asked to indicate whether the following induction/orientation activities are available at their setting, each coded as “Yes” or “No”:

- A: Courses/seminars/workshops attended in person
- B: Online courses/seminars/workshops
- C: Supervision by the ECEC setting leader and/or experienced ECEC staff
- D: Networking or collaboration with other ECEC settings
- E: Observation visits to other classroom/playgroup/group within the same setting
- F: Working in a team with experienced ECEC staff
- G: Use of portfolios/diaries/journals for self-reflection on own practice
- H: Reduced workload
- I: General/administrative introduction
- J: Coaching programme.

To calculate the sum, each “Yes” response was assigned a value of 1 and summed across variables SL2G29A through SL2G29J, resulting in a total ranging from 0 to 10. For a sum of zero, any combination

of “No” and “Omitted or invalid” values were possible, if at least one response was “No”. If all variables are marked as either 100% “Not administered” or 100% “Omitted or invalid”, the index is coded to match.

### **Sum of activities to facilitate children’s transitions (S2SNTRAC)**

To assess the extent to which ECEC settings support children’s transitions to a new ECEC setting or to ISCED 2011 level 1, an index was created using responses to variables SL2G35A-F. This question asked whether the setting undertakes specific activities aimed at facilitating smooth transitions for children.

Respondents were asked to indicate “Yes” or “No” for each of the following six activities:

- A: Communicating with receiving ECEC settings or ISCED level 1 schools about children making transitions
- B: Organising visits to the next ECEC setting or ISCED level 1 schools for transitioning children
- C: Holding meetings with staff across ECEC settings or ISCED level 1 schools
- D: Offering in-service training for ECEC staff on transition issues
- E: Working with local authorities to develop transition programmes
- F: Providing activities for parents or guardians to support the transition (e.g. information sessions, meetings or home visits).

Each “Yes” response was coded as 1, each “No” response as 0. The index was calculated by summing the number of “Yes” responses across items SL2G35A to SL2G35F, resulting in a value ranging from 0 to 6. For a sum of zero, any combination of “No” and “Omitted or invalid” values were possible, if at least one response was “No”. If all variables are marked as either 100% “Not administered” or 100% “Omitted or invalid”, the index is coded to match.

### **Sum of policies and practices related to diversity (S2SNDIPOL)**

To capture the extent to which ECEC settings implement diversity-related policies and practices, an index was created based on responses to variables SL2G39A-E. This question asked leaders whether specific diversity-supportive practices are implemented in their setting.

Respondents were asked to indicate “Yes” or “No” for each of the following five items:

- A: Supporting play that encourages children’s expression of diverse ethnic and cultural identities (e.g. re-enacting a religious festival learned about through parents, peers, staff or books)
- B: Including books and pictures that feature people from a variety of ethnic and cultural groups
- C: Including books and pictures that represent people with different physical needs
- D: Including books and pictures that reflect diverse family structures (e.g. single-parent families, families with parents from sexual or gender minorities)
- E: Employing staff who are representative of the diverse backgrounds of the children and families served.

Each “Yes” response was coded as 1, each “No” response as 0. The index was calculated by summing the number of “Yes” responses across SL2G39A to SL2G39E, resulting in a value ranging from 0 to 5. For a sum of zero, any combination of “No” and “Omitted or invalid” values were possible, if at least one response was “No”. If all variables are marked as either 100% “Not administered” or 100% “Omitted or invalid”, the index is coded to match.

### **Satisfaction with work at this ECEC setting (national quartiles) (S2LJOBSARQR)**

The variable categorises leaders’ reported satisfaction into national quartiles based on the values as recorded in S2LJOBSAR. The quartiles are based on estimated integer values and all observations with

the estimated quartile value were grouped into the same bin, typically the lower category, leading to groups with an unequal number and weighted proportion of observations in each. Non-missing values in the variable S2LJOBSAR were used to allocate cases to the following quartile categories: 1 = 1st national quartile; 2 = 2nd national quartile; 3 = 3rd national quartile; 4 = 4th national quartile. Cases with missing information in S2LJOBSAR were coded as “Omitted or invalid”.

### **Level of stress and impact on leaders’ well-being (national quartiles) (S2LSTRESLQR)**

The variable categorises leaders’ reported well-being into national quartiles based on the values recorded in S2LSTRESL. The quartiles are based on estimated integer values and all observations with the estimated quartile value were grouped into the same bin, typically to the lower category, leading to groups with an unequal number and weighted proportion of observations in each. Non-missing values in the variable S2LSTRESL were used to allocate cases to the following quartile categories: 1 = 1st national quartile; 2 = 2nd national quartile; 3 = 3rd national quartile; 4 = 4th national quartile. Cases with missing information in S2LJOBSAR were coded as “Omitted or invalid”.

#### *Staff level*

### **Staff age (grouped) (S2SAGEGR)**

The staff age group variable was derived from ECEC staff responses to the question about their age (variable SS2G02). A new variable was created by recoding the original responses into three age bands: 1 = Under age 30, 2 = Between ages 30 and 49, and 3 = Age 50 and older.

### **Staff role (grouped) (S2SROLEGR)**

This variable grouped the responses of SS2G03 into two categories: 1 = Leader or teacher, 2 = Other.

### **Staff employment status (grouped) (S2SEMPGR)**

This variable grouped the responses of SS2G05 into two categories: 1 = Permanent employment, 2 = Other.

### **Working hours and reasons for part-time work (S2SFPTW)**

The variable categorised ECEC staff based on their working hours and the reasons for part-time employment. It was constructed using responses in two variables: SS2G06, which asks about current working hours, and SSG07, which asks why the respondent works part-time.

In SS2G06, respondents were asked to report whether they work:

- “full-time (more than 90% of full-time hours)”
- “part-time (50-90% of full-time hours)”
- “part-time (less than 50% of full-time hours)”.

Respondents who indicated that they work part-time were then asked SSG07, which captures their primary reason for doing so based on two available response options:

- “I was only looking for part-time work (e.g. due to health, family commitments or further education)”
- “I was only offered part-time work (e.g. only part-time hours available or limited setting hours)”.

Based on the responses, the variable S2SFPTW was created to distinguish between full-time and part-time staff, as well as the reasons for part-time employment. Staff were classified as full-time if they reported working more than 90% of full-time hours (1). Those working part-time were further divided based on their

reasons: staff who reported choosing part-time work – for example, due to personal preferences such as health, family commitments or education – were classified as voluntary part-time (2). In contrast, staff who indicated that they were only offered part-time hours, such as when only part-time positions were available, were categorised as involuntary part-time (3).

### **Staff work experience in total (grouped) (S2SEXPGR)**

This variable grouped the responses of SS2G08B into two categories: 1 = 3 years or less, 2 = 4 years or more.

### **Staff education groups (S2SISCED)**

This variable was constructed using responses to the question regarding the highest level of formal education completed by staff (variable SS2G11), with categories: 1 = ISCED 2011 level 3 and below, 2 = ISCED 2011 level 4 or ISCED 2011 level 5, and 3 = ISCED 2011 level 6 and above.

### **Staff education or training to work with children (S2SETCHD)**

This variable grouped the responses of SS2G12A-F into two categories: 1 = Yes, 2 = No. If any response was marked as “Yes”, then the variable was coded as “Yes”, otherwise “No”.

### **No participation in professional development activities (S2SNOPD)**

The variable identified whether ECEC staff reported no participation in any professional development activities during the past 12 months. It was based on responses to variables SS2G15A-I, which presented the following response categories: “Yes, in person”; “Yes, virtual or online”; “Yes, in person and virtual/online” and “No”.

The activities listed included:

- A: Courses, seminars or workshops
- B: Conferences where ECEC staff and/or researchers present or discuss education and care issues
- C: Qualification programmes (e.g. degree programmes)
- D: Planned visits to other ECEC settings
- E: Planned visits to other groups within the same setting
- F: Coaching programmes as part of a formal ECEC setting arrangement
- G: Formal or informal staff networks for professional learning
- H: Induction or orientation programmes
- I: Other professional development activities.

The variable was coded into the following categories: 0 = Participation in any professional development activities over the last 12 months, 1 = No participation in professional development activities over the last 12 months.

It was coded as 1 (No participation) if the respondent answered “No” to all listed activities or for any combination of “No” responses and missing. It was coded as 0 (participation) if the respondent indicated participation in any activity – regardless of format – in at least one of the items.

### **Mode of professional development participation (S2PDMODE)**

The variable captured the mode in which ECEC staff participated in professional development activities over the past 12 months. It was based on responses to question SS2G15A-I, which asked whether staff

had engaged in various types of professional development, and, if so, whether participation occurred in person, virtually/online, or in both formats.

The activities listed include courses and workshops, conferences, qualification programmes, planned visits, coaching programmes, staff networks, induction programmes and other forms of professional development.

Based on the responses across all items, the variable S2PDMODE was recoded into four categories:

- 1 = Only in person. Assigned when the respondent participated exclusively in person, meaning that for all activities where participation was reported, the response was “Yes, in person” (with any remaining items marked as “No” or missing).
- 2 = Only virtual/online participation. Assigned when the respondent participated exclusively in virtual or online activities, meaning that for all activities where participation was reported, the response was “Yes, virtual or online” (with any remaining items marked as “No” or missing).
- 3 = Mixed modes of participation. Assigned when the respondent participated in both in-person and virtual/online activities, representing any combination of responses not captured by Categories 1 or 2.
- 4 = No professional development. Assigned when no participation was reported, meaning all responses were a combination of “No” or missing.

#### **No support for professional development activities (S2SNOPDSUP)**

The variable indicated whether ECEC staff received no support for professional development activities undertaken during the past 12 months. It is based on responses to variables SS2G18A-H, which asked whether specific forms of support were provided for participation in professional development.

Respondents were asked to indicate whether they received any of the following types of support:

- A: Release from working with children during regular working hours (e.g. reduced teaching time, days off, study leave)
- B: Monetary supplements for time spent outside working hours
- C: Reimbursement or payment of professional development costs (e.g. registration fees)
- D: Reimbursement for out-of-pocket costs (e.g. transportation, materials, food)
- E: Materials needed for the activities (e.g. office supplies)
- F: Non-monetary rewards (e.g. classroom materials, book vouchers, software/applications)
- G: Non-monetary professional benefits (e.g. fulfilling professional development requirements, enhanced promotion opportunities)
- H: Increased salary.

Available response categories for these variables were: “Yes”, “No”.

The variable was coded as 1 (no support received) if the respondent answered “No” to all items or for any combination of “No” responses and missing. It was coded as 0 (support received) if the respondent selected “Yes” for at least one type of support.

#### **Percentage of time spent with direct contact with children (S2STMWCHD)**

This percentage variable was calculated by SS2G28A divided by the sum of SS2G28A and SS2G28B, multiplied by 100, provided the sum was greater than zero. Any output greater than 100% was automatically coded to “Omitted or invalid”.

### **Percentage of time spent without contact with children (S2STMWOCHD)**

This percentage variable was calculated by SS2G28B divided by the sum of SS2G28A and SS2G28B, multiplied by 100, provided the sum was greater than zero. Any output greater than 100% was automatically coded to “Omitted or invalid”.

### **Percentage of time spent planning or preparing play and/or learning activities on your own (S2SPTMPROWN)**

This percentage variable was calculated by SS2G28C divided by the sum of SS2G28A and SS2G28B, multiplied by 100, provided the sum was greater than zero. Any output greater than 125% was automatically coded to “Omitted or invalid”.

### **Percentage of time spent planning or preparing play and/or learning activities with other ECEC staff (S2SPTMPROTH)**

This percentage variable was calculated by SS2G28D divided by the sum of SS2G28A and SS2G28B, multiplied by 100, provided the sum was greater than zero. Any output greater than 125% was automatically coded to “Omitted or invalid”.

### **Percentage of time spent documenting children’s development, well-being and learning (S2SPTMDOC)**

This percentage variable was calculated by SS2G28E divided by the sum of SS2G28A and SS2G28B, multiplied by 100, provided the sum was greater than zero. Any output greater than 125% was automatically coded to “Omitted or invalid”.

### **Percentage of time spent collaborating and speaking with parents or guardians from this ECEC setting (S2SPTMCOL)**

This percentage variable was calculated by SS2G28F divided by the sum of SS2G28A and SS2G28B, multiplied by 100, provided the sum was greater than zero. Any output greater than 125% was automatically coded to “Omitted or invalid”.

### **Percentage of time spent participating in management, staff meetings and general administrative work (S2SPTMMGM)**

This percentage variable was calculated by SS2G28G divided by the sum of SS2G28A and SS2G28B, multiplied by 100, provided the sum was greater than zero. Any output greater than 125% was automatically coded to “Omitted or invalid”.

### **Percentage of time spent laundry, tidying-up, cleaning, shopping or food preparation tasks (S2SPTMHOU)**

This percentage variable was calculated by SS2G28H divided by the sum of SS2G28A and SS2G28B, multiplied by 100, provided the sum was greater than zero. Any output greater than 125% was automatically coded to “Omitted or Invalid”.

### **Sum of staff members working with the target group (S2SUMSTAFFTG)**

To determine the total number of staff members working with the target group, a composite variable was created based on responses to SS2G34A-E. This question asked for the number of individuals working with the target group on a specific reference day, grouped by role. Incomplete responses to this variable will still lead to a final value for S2SUMSTAFFTG, for if at least one item was answered then a sum was



available. Missing values such as “Omitted or invalid” were treated as if they were a 0 response during the calculation.

Specifically, the variable was calculated by summing the reported number of individuals in the following categories:

- A: ECEC setting leaders and teachers
- B: Assistants
- C: Staff for individual children
- D: Other ECEC staff (e.g. staff for special tasks, intern).

#### **Sum of staff members working with the target group (grouped) (S2SUMSTAFFTGGR)**

This variable grouped the responses of S2SUMSTAFFTG into two categories: 1 = 3 or fewer, 2 = 4 or more.

#### **Number of children in target group (grouped) (S2NUMCHDTG)**

This group variable collapsed the responses of SS2G35 into three categories: 1 = 10 children or fewer, 2 = 11 to 20 children, and 3 = 21 children or more.

#### **Proportion of children in target group whose first language is different (S2SPRPTGLNG)**

This variable calculated the proportion of children in the target group whose first language is different by taking SS2G36A divided by SS2G35, provided SS2G35 was greater than zero. The result was collapsed into two categories: 1 = Less than 10%, 2 = 10% or more. Those cases where SS2G35 was missing were coded to “Omitted or invalid”.

#### **Proportion of children in target group with special education needs (S2SPRPTGSEN)**

This variable calculated the proportion of children in the target group with special education needs by taking SS2G36B divided by SS2G35, provided SS2G35 was greater than zero. The result was collapsed into two categories: 1 = Less than 10%, 2 = 10% or more. Those cases where SS2G35 was missing were coded to “Omitted or invalid”.

#### **Proportion of children in target group from socio-economically disadvantaged homes (S2SPRPTGDIS)**

This variable calculated the proportion of children in the target group from socio-economically disadvantaged homes by taking SS2G36C divided by SS2G35, provided SS2G35 was greater than zero. The result was collapsed into two categories: 1 = Less than 10%, 2 = 10% or more. Those cases where SS2G35 was missing were coded to “Omitted or invalid”.

#### **Proportion of children in target group who are immigrants or with migrant backgrounds (S2SPRPTGMIG)**

This variable calculated the proportion of children in the target group who are immigrants or with migrant backgrounds by taking SS2G36D divided by SS2G35, provided SS2G35 was greater than zero. The result was collapsed into two categories: 1 = Less than 10%, 2 = 10% or more. Those cases where SS2G35 was missing were coded to “Omitted or invalid”.

### **Proportion of children in target group belonging to ethnic/national minorities (S2SPRPTGMIN)**

This variable calculated the proportion of children in the target group belonging to ethnic/national minorities by taking SS2G36E divided by SS2G35, provided SS2G35 was greater than zero. The result was collapsed into two categories: 1 = Less than 10%, 2 = 10% or more. Those cases where SS2G35 was missing were coded to “Omitted or invalid”.

### **Satisfaction with profession (national quartiles) (S2PROSARQR)**

The variable categorised staff reported satisfaction into national quartiles based on the values as recorded in S2PROSAR. The quartiles were based on estimated integer values and all observations with the estimated quartile value were grouped into the same bin, typically the lower category, leading to groups with an unequal number and weighted proportion of observations in each. Non-missing values in the variable S2PROSAR were used to allocate cases to the following quartile categories: 1 = 1st national quartile; 2 = 2nd national quartile; 3 = 3rd national quartile; 4 = 4th national quartile. Cases with missing information in S2PROSAR were coded as “Omitted or invalid”.

### **Level of stress and its impact on staff well-being (national quartiles) (S2STRESSQR)**

The variable categorised staff reported level of stress and its impact on staff well-being into national quartiles based on the values as recorded in S2STRESS. The quartiles were based on estimated integer values and all observations with the estimated quartile value were grouped into the same bin, typically the lower category, leading to groups with an unequal number and weighted proportion of observations in each. Non-missing values in the variable S2STRESS were used to allocate cases to the following quartile categories: 1 = 1st national quartile; 2 = 2nd national quartile; 3 = 3rd national quartile; 4 = 4th national quartile. Cases with missing information in S2STRESS were coded as “Omitted or invalid”.

## **11.3. Scaling procedures of questionnaire items**

TALIS aims to collect robust and rich information about teacher, principal, staff and leader characteristics as well as information about their schools and centres. Many of the specific personal traits, such as attitudes and self-efficacy, cannot be observed directly, but only through expressed discrete opinions or intended and observed behaviour. Such traits are considered latent, that is, not directly observable. Large-scale studies, such as TALIS, purposefully develop instruments that consist of questions with multiple items to measure various latent traits. The presence of multiple items makes it possible to estimate and test the underlying measurement models. The procedure used to combine responses to these questions into a single scale score representing the latent construct of interest is called scaling.

The instruments used in TALIS 2024 are the teacher, principal, staff and leader questionnaires, each with items designed to capture specific facets of the envisaged latent traits. These instruments were developed to collect empirical evidence and test theoretical assumptions derived from the TALIS conceptual framework (see Chapter 2). This framework builds on constructs established in previous TALIS cycles while also introducing new dimensions considered relevant to current educational contexts. Accordingly, questionnaire development was theory-driven and informed by both accumulated experience and evolving conceptual priorities. The development of the instruments follows a multi-step process to ensure validity of the scales (Messick, 1995<sup>[1]</sup>). The data intended to represent constructs and to be used for scale score computation were subjected to extensive quality checks that included the use of item-level statistics to check missing data, response category frequencies and a reliability estimate.

Field trial data were used to evaluate the instruments with a focus on items intended to measure latent constructs. The TALIS international consortium, the Questionnaire Expert Group (QEG) and the OECD

then used these results to make decisions about item and scale selection and revision for the main survey. In some instances, the decision was made to not create scale scores but instead to report the individual items. Some items were removed from the instruments after the field trial to reduce the length of the questionnaires (for details on this matter, see Chapter 3). All decisions considered the state of instrument development at the time of the field trial and the low number of cases in the field trial data. This means that the limitations of the field trial were considered in the decision-making process. For example, items displaying less favourable item statistics were occasionally retained when they were deemed theoretically essential for the valid representation of the construct.

Analysis of the main survey data involved another thorough examination of the extent to which items of each scale measured its construct consistently (construct reliability) (Lyubomirsky and Lepper, 1999<sup>[2]</sup>) and the extent to which the scale measured the same construct in a similar manner across the countries/territories (construct invariance) (Cheung and Rensvold, 2002<sup>[3]</sup>; Vandenberg and Lance, 2000<sup>[4]</sup>). The process used for scale evaluation and scale score calculation in the main survey encompassed the following steps:

1. data preparation
2. scale evaluation
  - a. item statistics
    - i. percent of missingness
    - ii. distribution of responses across response options
  - b. scale analysis
    - i. item-total correlation (discrimination)
    - ii. reliability (based on a pooled international dataset and by country/territory)
    - iii. CFA based on a pooled international dataset (combined dataset including most of the countries/territories)
    - iv. confirmatory factor analysis by country/territory (for each country/territory within each level)
    - v. multiple-group CFA (MGCFA) for measurement invariance testing
3. scale score computation
  - a. scale score estimation with parameters based on the pooled international dataset
  - b. scale score standardisation
  - c. composite scale score computation.

Each of the steps mentioned above is described in more detail in the following sections. For some scales there was an iterative process to determine the final scale composition resulting in re-estimating scale and measurement invariance analyses multiple times until an acceptable solution was found.

The psychometric adequacy of the scales was assessed by estimating unidimensional CFA models for each scale. Given that the responses to the items come from the selection of ordered categorical (ordinal) response scales (e.g. Likert scale), the analysis items are considered as categorical in each part of the analysis. One of the advantages of categorical CFA models is that they do not make distributional assumptions about the observed variables and are thus appropriate to use with ordinal response scales. However, this leads to estimating more item parameters, as an additional threshold parameter has to be estimated for each intersection of two ordinal response categories. This has further implications during measurement invariance testing, as there are more options for specifying the model identification and to constrain model parameters (Wu and Estabrook, 2016<sup>[5]</sup>). The factor and measurement invariance analyses were estimated using the weighted least squares mean and variance adjusted (WLSMV) estimator. WLSMV is appropriate for ordinal data and adopted when the multivariate normality assumption of the observed variables is violated (Millsap and Yun-Tein, 2004<sup>[6]</sup>; Mîndrila, 2010<sup>[7]</sup>; Wu and Estabrook,

2016<sup>[5]</sup>). The observed covariance matrix (S) that is used with continuous indicators is replaced by a correlation matrix using polychoric correlations in the case of ordered polytomous indicators.

In CFA models for ordinal indicators each observed variable is assumed to reflect an underlying continuous latent response variable ( $y^*$ ). These  $y^*$  variables are assumed to be normally distributed and are partitioned by threshold parameters that define the transitions between response categories. Estimation is typically based on the polychoric correlation matrix among the  $y^*$  variables, and thus the observed variances of the categorical indicators are not modelled directly (Brown, 2015<sup>[8]</sup>). In our analyses,  $y^*$  is scaled in a way that the variance of  $y^*$  is fixed to 1 for all items. As a result, the residual variances of categorical indicators are not identified and not part of the CFA model. This approach is referred to as delta parametrisation. All analyses related to psychometric adequacy of the questionnaire scales were conducted using the 4.2.1 version of the R programming language (R Core Team, 2022<sup>[9]</sup>) and the following libraries:

- version 1.9.8 of the wCorr library (Bailey and Emad, 2021<sup>[10]</sup>), to estimate correlations
- version 0.6-19 of the lavaan library (Rosseel, 2012<sup>[11]</sup>), to conduct factor analysis.

In cases where the initial model did not meet acceptable fit criteria, one of the following modifications was applied: i) reducing the number of items; or ii) splitting the scale into two constructs. Most model improvements were suggested by the modification indices produced by the CFA implementation software. These reflect the approximate change of  $\chi^2$  if certain fixed/constrained parameters are freely estimated (Brown, 2015<sup>[8]</sup>). Only selected model re-specification resulting in the biggest (or, for some cases, second biggest) change to  $\chi^2$  were considered. The items where model modifications suggested an included correlation (residual covariance) were inspected. In addition, items with very low or negative loadings were considered for removal from the scale. All scale modifications were accompanied by plausibility checks conducted by the scaling team, as well as by the QEG chair in consultation with the OECD, thus acknowledging that changes to the model structure had relevant implications for scale content.

It is important to stress that these statistical criteria were used for the decision-making process that was based on an iterative process involving content-related considerations between the International Association for the Evaluation of Educational Achievement (IEA) scaling team, the QEG chair and the OECD. Scales that could not be improved through modifications were dropped from the analysis.

### 11.3.1. Data preparation

TALIS 2024 distinguished between valid and missing data values. Missing data of items included in scales were assigned a value of “Omitted or invalid” or “Not administered”.

- Omitted or invalid: The respondent was presented the question but did not respond, leaving the corresponding item or question blank. Some questions consisted of numeric responses, which were checked for plausibility. If the values for respondents fell outside a specific range, that value was considered invalid (for more details see Chapter 8). These were considered only when presenting the percentage distributions of single items and did not contribute to the calculation of scale statistics.
- Not administered: The missing code is used for those items that were deliberately not administered to a respondent (due to the design of teacher questionnaire Forms A, B and C, for example). These items did not contribute to the calculation of the item statistics or scale construction.

Scale evaluation was conducted both on single country/territory datasets and on a pooled international dataset, where the data from all countries/territories were combined into a single dataset. The countries/territories excluded from the pooled international dataset are presented in Table 11.3. In analyses of pooled international data, the data for each included country/territory are weighted using sampling weights transformed in a way that each country/territory contributes equally to the results. Since

weights were not rescaled for each scale to account for the cases with only one valid response or less, the effective contribution of each country/territory may vary slightly by scale.

**Table 11.3. Included and excluded countries/territories from the international pooled data**

| Population                   | Number of countries/territories in the pooled sample for scale evaluation | Excluded countries/territories                     |
|------------------------------|---------------------------------------------------------------------------|----------------------------------------------------|
| <b>TALIS core survey</b>     |                                                                           |                                                    |
| ISCED 2 Teachers             | 49                                                                        | Alberta (Canada), Netherlands, New Zealand, Norway |
| ISCED 1 Teachers             | 12                                                                        | Netherlands, New Zealand                           |
| ISCED 3 Teachers             | 8                                                                         | No exclusions                                      |
| ISCED 2 Principals           | 49                                                                        | Alberta (Canada), Netherlands, New Zealand, Norway |
| ISCED 1 Principals           | 12                                                                        | Netherlands, New Zealand                           |
| ISCED 3 Principals           | 7                                                                         | Flemish Community (Belgium)                        |
| <b>TALIS Starting Strong</b> |                                                                           |                                                    |
| ISCED 02 Staff               | 14                                                                        | New Zealand                                        |
| ISCED 02 Leaders             | 14                                                                        | New Zealand                                        |
| U3 Staff                     | 6                                                                         | New Zealand                                        |
| U3 Leaders                   | 6                                                                         | New Zealand                                        |
| <b>TKS</b>                   |                                                                           |                                                    |
| ISCED 2 Teachers             | 8                                                                         | No exclusions                                      |

Note: For the TALIS core survey, the excluded countries/territories are based on recommended adjudication ratings. The listed countries/territories were rated as “insufficient”. Because of the small number of countries/territories participating in TALIS Starting Strong, no country/territory was excluded except for New Zealand. The reason was that their data represent only respondents included in the sample and not the population targeted by the survey. For the TKS, no country/territory was excluded because of the small number of countries/territories that participated in the international component. The two Canadian provinces were combined into one dataset for the TALIS Starting Strong U3 population.

### 11.3.2. Scale evaluation

#### *Item statistics*

Items were analysed in relation to missingness and the distribution of the responses. Where applicable, items were reverse coded, so that the higher the value on an item, the higher the level of the latent construct. The item statistics were first evaluated based on the international pooled data. Selected item statistics were also reviewed by country/territory: percentage of omitted responses, percentage of infrequently used response categories and distribution of country/territory item means. For the first two statistics, country/territory data for each item were assessed based on the proportion of omitted responses and infrequently used categories. Countries or territories were flagged if the share of omitted responses exceeded specific thresholds: under 10% was not flagged, between 10% and 20% triggered a moderate flag and values above 20% were flagged for closer consideration. TALIS aims to provide internationally comparable information on teachers, staff, principals and leaders. To support this objective, item response distributions are monitored to identify whether certain response categories are used infrequently across countries or territories. Specifically, countries/territories are flagged when one or more response categories are selected by fewer than 2.5% of respondents. If one response category falls below this threshold, a moderate flag is assigned; if two or more response categories fall below, a stronger flag is issued. Limited variation in a single country or territory is not necessarily problematic, as it may reflect context-specific realities. However, if the same item shows restricted variation in multiple countries or territories, this may indicate that the item provides limited discriminatory power and thus contributes less to meaningful international comparisons.

## Scale analysis

In order to obtain a reliable and valid scale estimate, whenever conducting (single country/territory or pooled) scale analysis, it was first checked that each of the items within a scale presented variation.

The evaluation of the scales was based on various criteria. Inter-item correlations were checked (flagging correlations above 0.8 as well as correlations below 0.2), corrected item-total correlations (values less than 0.2 were considered as low), reliability, CFA model results and multiple-group CFA (MGCFA) model results to evaluate measurement invariance. For the CFA model fit, commonly used fit indices were considered. The cut-off criteria that were used for the scale evaluation are listed below.

### Reliability

Scale analysis encompassed the calculation of Cronbach's alpha reliability. It was estimated using a polychoric correlation matrix taking into account the ordinal nature of the response data. Cronbach's alpha (Cronbach, 1951<sup>[12]</sup>) index was used as an indication of the internal consistency of each scale. Higher values of the coefficient indicate higher internal consistency. Consistent with previous TALIS cycles, the following cut-off values of the reliability index were used:  $\geq 0.700$  (good),  $0.600-0.699$  (acceptable),  $< 0.600$  (poor).

### Confirmatory factor analysis based on the pooled international dataset

CFA was conducted to evaluate the measurement models. The evaluation focused on the fit between the model-implied data structure and the observed data structure, as well as on key model parameters, particularly the factor loadings. Using the model fit indices as evaluation criteria, the specified (or theoretical) model of each scale is assessed with respect to its alignment to the empirical data (Hu and Bentler, 1999<sup>[13]</sup>).

To evaluate overall performance, CFA was conducted on an international pooled dataset composed of data from most countries/territories at ISCED level 2, which is the TALIS target population surveyed by all countries/territories in the TALIS core survey. As TALIS Starting Strong did not have a core population, pooled international datasets for both populations were considered separately when making a final decision. For included and excluded countries/territories, please refer to Table 11.3.

The initial examination of each scale was based on the CFA models' fit indices. The models that passed the cut-off criteria described below proceeded to further steps, while improvements were made to the models of the scales that originally failed to pass the cut-off values. Model improvements included changes to the model structure, mostly through item exclusions. Modified models were re-tested using the same procedure.

The measures of model-fit indices from categorical CFA provide the extent to which the data structure implied by an a priori model matches the observed data. Four commonly used fit indices include the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA) and the standardised root mean square residual (SRMR). Fit indices are often differentially affected by various aspects of the analytic situation, such as sample size, model complexity, estimation method, amount and type of misspecification, normality of data and type of data. Commonly used cut-off criteria for model fit evaluation are presented below (Browne et al., 1993<sup>[14]</sup>; Hu and Bentler, 1999<sup>[13]</sup>; Kline, 2015<sup>[15]</sup>; Little, 2013<sup>[16]</sup>; Schermelleh-Engel, Moosbrugger and Müller, 2003<sup>[17]</sup>):

- Comparative fit index (CFI): This index compares the targeted factor structure model and the baseline model (all relationships fixed to zero). A higher value indicates a better model fit. The following cut-off values were used as guidelines:  $\geq 0.950$  (good),  $0.900-0.949$  (acceptable),  $< 0.900$  (poor).



- Tucker-Lewis index (TLI): This index gives the distance between the targeted factor structure model and the baseline model as a proportion. Compared to the CFI, the TLI includes a stronger penalty for model complexity, and thus gives priority to parsimonious models. A higher value indicates a better model fit. The following cut-off values were used as guidelines:  $\geq 0.950$  (good),  $0.900-0.949$  (acceptable),  $< 0.900$  (poor).
- Root mean square error of approximation (RMSEA): This index is an “error of approximation” index because it assesses the extent to which a model fits reasonably well in the population and relies on the noncentral  $\chi^2$  distribution. The non-centrality parameter expresses the degree of model misspecification. It approaches 0 as the fit of the model improves. The following cut-off values were used as guidelines:  $\leq 0.050$  (good),  $0.051-0.100$  (acceptable),  $> 0.100$  (poor).
- Standardised root mean square residual (SRMR): This index indicates the degree of model misspecification in terms of the model average of squared residuals between the observed covariance and the model-implied covariance matrices, as well as differences in observed and model-implied item intercepts. The value is provided in a standardised metric ranging from 0 to 1, with smaller values indicating a better model fit. The following cut-off values were used as guidelines:  $\leq 0.050$  (good),  $0.051-0.100$  (acceptable),  $> 0.100$  (poor).

In addition to model fit, standardised factor loadings were also inspected, as they are equally important statistics to consider in model evaluation. Factor loadings reflect the strength of the relationship between the item and the latent scale. Weak factor loadings undermine the interpretability of the latent structure, rendering model fit indices largely moot. The following cut-off values were used in our evaluation:

- Factor loadings higher than 0.600 were considered good, indicating strong relationships between the item and the scale.
- Factor loadings between 0.450 - 0.599 were considered acceptable.
- Factor loadings below 0.450 were considered poor, as they indicate weaker relationships.

### **Confirmatory factor analysis based on the country/territory dataset**

The CFA model was tested on the datasets of each country/territory across all participating populations, using the same scale composition as used on the pooled dataset described in the previous section. For each scale, a total of 79 single country/territory CFA models were analysed across all populations for the TALIS core survey (ISCED levels 1, 2 and 3), 22 models for TALIS Starting Strong (ISCED level 02 and U3) and 8 for the TKS (ISCED level 2). The evaluation procedure for these models was very similar to that of the pooled international model. The model fits of the final scale compositions for each country/territory are included in the results section.

### **Measurement invariance analysis and model evaluation across countries/territories**

The aim of TALIS is to enable comparisons between countries/territories. A prerequisite for such comparisons is that the instruments and scales used are comparable. The statistical procedure used to analyse the comparability of latent scales in different groups is called measurement invariance testing (Cheung, 1999<sup>[18]</sup>; Davidov, 2008<sup>[19]</sup>; Steenkamp and Baumgartner, 1998<sup>[20]</sup>; van de Vijver et al., 2019<sup>[21]</sup>; OECD, 2014<sup>[22]</sup>; Cheung and Rensvold, 2002<sup>[3]</sup>). The TALIS 2024 scales were evaluated with respect to their equivalence (comparability) across countries/territories within levels, within the CFA framework. More details on the measurement invariance testing within the CFA framework can be found in (OECD, 2014<sup>[22]</sup>).

It is important to remember that the construction of latent scales is based on associations between several items and the underlying latent construct, as estimated in the measurement model. Specified within the CFA framework, the measurement model contains different parameters that are estimated: item factor loadings, intercepts (or thresholds in the case of categorical CFA) and residual variances, as well as latent means and variances (Davidov et al., 2014<sup>[23]</sup>).



During the procedure to test for measurement invariance, different (nested) models are specified and compared to one another. The models differ from one another in terms of certain parameters being either unconstrained (i.e. freely estimated) between groups, which implies incomparability across groups, or constrained (i.e. to the same value) between groups, which implies comparability across groups. The degree to which the stricter model (i.e. a model that assumes equal parameters across groups), as compared to the less strict model (i.e. a model that assumes some degree of flexibility of parameters between groups) suits the data is evaluated by means of model fit comparisons.

The comparability between countries/territories was evaluated for each scale in the teacher, principal, staff and leader questionnaires by estimating MGCFA models. To estimate these models, two conditions must be met for a group (country/territory) to be included in the measurement invariance analysis:

- A minimum number of 150 respondents with at least 2 responses provided for each scale. Due to low sample size and to get an indication about scale comparability, this cut-off was lowered to 100 for the TALIS Starting Strong leader population.
- Each item included in the scale had to present the same number of used response categories in each group.

If a country/territory failed to meet these requirements, the data for that country/territory were not used in the measurement invariance analysis for the relevant scale. The measurement invariance analysis was checked within population levels across countries/territories. Countries/territories excluded from the pooled model were excluded from measurement invariance testing as well (see Table 11.3 for details).

In multiple groups analysis, various constraints can be set for model identification. In the baseline multiple groups model, the factor loadings and thresholds are freely estimated in all groups, with the variance of the latent factor fixed to one in all groups. The baseline model tests whether the model structure, including the number of latent variables and the pattern of factor loadings and thresholds, is the same across groups.

Different sequences have been proposed for comparing models for measurement invariance testing, along with differing recommendations for the cut-off criteria used in these comparisons. Following Rutkowski and Svetina (2017<sup>[24]</sup>), after specifying a baseline (i.e. unconstrained) model, the loadings were next fixed to be equal across groups and in the last step the factor loadings and thresholds were constrained to equality across groups. The variance of the latent factor of group one was fixed to one in both models and freely estimated in other groups.

To examine the plausibility of invariant loadings and, subsequently, invariant thresholds, the changes to the model fit indices CFI, TLI, RMSEA and SRMR were observed. The following cut-off values were considered as general guidelines, to evaluate evidence of reasonable measurement invariance:

- The baseline invariance (the structure of the item-construct relationship is identical across all groups, thresholds and loadings are estimated freely across the groups) was established if the model passed the following criteria:  $CFI/TLI \geq 0.90$ ,  $RMSEA/SRMR \leq 0.10$ . If the results show considerable deviance from all of these criteria, the scale reached no invariance.
- The loadings invariance (loadings constrained to equality across all groups) was established if the difference in fit indices between the loadings and baseline model did not considerably exceed the following criteria:  $\Delta CFI/\Delta TLI \geq -0.004$ ,  $\Delta RMSEA/\Delta SRMR \leq 0.05$  for multiple-group comparisons across the countries/territories (Rutkowski and Svetina, 2017<sup>[24]</sup>).
- The thresholds and loadings invariance (thresholds and loadings constrained to equality across all groups) was established, if the difference in the fit indices between the equal loadings and thresholds and the equal loadings models did not considerably exceed the following criteria:  $\Delta CFI/\Delta TLI \geq -0.004$  and  $\Delta RMSEA/\Delta SRMR \leq 0.01$  (Rutkowski and Svetina, 2017<sup>[24]</sup>).

Of note, the strategy adopted for measurement invariance testing follows the usual procedure using continuous models. But it needs to be pointed out that before meaningfully interpreting the equality of factor loadings alone, first the equality of thresholds would need to be established. If thresholds differ, the latent response variables are scaled differently, and the correlations between them are not comparable.

For the principal and leader instruments, sample sizes were smaller and, in certain cases, the distribution of responses was skewed, resulting in certain response categories not being used in some countries. In these few instances, response categories were collapsed.

There were some cases where the baseline model was “just identified”, meaning that the model fit could not be evaluated due to the lack of degrees of freedom. The fit indices therefore indicated perfect model fit because the model was derived directly from the data (Brown, 2015<sup>[8]</sup>). These cases occur in unidimensional scales with three items, resulting in a model that perfectly described the empirical structure of data. When comparing the fit indices of a perfectly fitting baseline invariant model with an equal loadings invariant model, differences are often greater than the recommended thresholds. Thus, in the TALIS 2024 scale evaluation, the models with three indicators were considered to be partially invariant if the equal loadings model fitted the data well (with the same criteria used for the baseline model used for the evaluation). The equal loadings and thresholds model are then evaluated using the same change-in-fit criteria applied to the equal loadings model for longer scales ( $\Delta CFI/\Delta TLI \geq -0.004$  and  $\Delta RMSEA/\Delta SRMR \leq 0.05$ ).

The reason for these special evaluation criteria is that the addition of constraints to a just-identified model typically leads to worse fit indices beyond the difference criterion between the equal loadings and baseline models outlined above, with this worsening having the potential to influence the resulting level of invariance. Models with low degrees of freedom (1 or 2) share the same problem but, as for TALIS 2018, the decision was to adopt these specific criteria only for three-item scales.

### 11.3.3. Computation of scale scores and their use for analysis

#### *Scale score estimation*

After completion of the scale evaluation, scale scores for each of the constructs were created. Using scale scores instead of analysing single items or sum scores offers many methodological and practical advantages. Although scale scores are not completely free of measurement error, when compared to individual variables this error is often minimised, thus increasing the reliability of these scores (Brown, 2015<sup>[8]</sup>; Yang-Hansen, Rosén and Gustafsson, 2006<sup>[25]</sup>). In practice, using a single score enhances the readability, interpretation and implementation of analysis as compared to analysis based on a set of variables. Another advantage of scale scores compared to simple sum scores is that the former accounts for differences in the relative strength of the relationships between the latent construct and the items (see for example Cheung and Rensvold (2002<sup>[3]</sup>)). Scale scores also have better metric properties than simple sum scores. In addition, scale score computations account for missing data while still producing a score for each observation, while this is more difficult to obtain using a simple sum score. As in previous TALIS cycles, scale score computation based on CFA was used during TALIS 2024 (OECD, 2019<sup>[26]</sup>; OECD, 2019<sup>[27]</sup>; OECD, 2014<sup>[22]</sup>; OECD, 2010<sup>[28]</sup>).

To compute estimated values for the factor scores in the model, the Empirical Bayes Modal (Skron dal and Rabe-Hesketh, 2004<sup>[29]</sup>) approach available in the R package named lavaan was used. This is a two-step procedure, where the structural parameters (e.g. factor loadings and (co)variances) are estimated first, and then these estimated structural parameters are used as fixed parameters to estimate the factor scores. For all scales, the pooled international model parameters were used to calculate the factor scores for each respondent. Scale scores were calculated for respondents that provided at least two responses to the items included in the scale. There was no score imputation for non-respondents or respondents with a single response.

Among the scales that met the evaluation criteria and were retained for analysis, scale scores were computed in nearly all cases, with only a few exceptions. The reason for not computing scores for a scale was a missing item from the scale for a country/territory. This happened when a country/territory did not administer an item, or an item was deleted because of an administration or translation error. These cases are described in Table 11.4.

**Table 11.4. Countries/territories without scale scores**

| Component             | Level            | Respondent | Scale     | Country/territory without scale score                                                                  |
|-----------------------|------------------|------------|-----------|--------------------------------------------------------------------------------------------------------|
| TALIS core survey     | ISCED 2          | Teachers   | T4WELS    | Viet Nam                                                                                               |
|                       |                  |            | T4STUHAR  | Azerbaijan, Bahrain, Israel, Kazakhstan, Morocco, Singapore, Türkiye, United Arab Emirates, Uzbekistan |
|                       | ISCED 1, ISCED 2 | Teachers   | T4ADLE    | Slovenia                                                                                               |
| TALIS Starting Strong | ISCED 02         | Leaders    | S2LSTRESG | Israel                                                                                                 |
|                       |                  |            | S2LSTRESP | Israel                                                                                                 |

### *Scale score standardisation*

To enhance the interpretation, the scale scores were standardised in such a way that the value 10 corresponds to the item mid-point value (IMV) of the response scale. Of note, this approach differs from standardisations in which a specific value is set to be equal to the mean of the scale. Before presenting the formula, the interpretation of the scale score values is explained referring to the example presented in Figure 11.1, which displays the questionnaire items which were used to create the scale *joy of teaching* (T4JOYTCH). The metric of scale scores was transformed to indicate the relative mid-point of the original scale items' categories. More specifically, T4JOYTCH is measured by responses to items A through D (with variable names TT4G80A through TT4G80D) from question in the teacher questionnaire. These items contained the responses “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree” coded 1 through 4 respectively.

Numerically, the mid-point for each item is 2.5, as shown in the figure. To calculate the IMV for each individual, a simple average was calculated for all item responses. Conceptually, if an individual's IMV is less than 2.5 then this suggests that the respondent on average disagrees with all of the items. An IMV greater than 2.5 suggests the respondent on average agrees to the included items. A value of 2.5 suggests indifference.

The estimated factor scores were standardised using data from ISCED level 2 (in the case of the TALIS core survey and TKS) and data from ISCED level 02 (for TALIS Starting Strong) that were included in the evaluation procedure (for details on excluded countries/territories, see Table 11.3). A metric with a standard deviation of 2.0 and 10 corresponding to the IMV was set to standardise the factor scores. This mathematical transformation ensured that all or almost all values were positive, thus allowing for a convenient interpretation. Mathematically, the standardisation is represented as follows:

$$X_i = \left( \frac{F_i - \bar{F}_M^*}{\sigma_{F^*}} \right) * 2 + 10$$

where  $X_i$  is the standardised factor score of individual  $i$ ,  $F_i$  is the raw estimated factor score of that individual,  $\bar{F}_M^*$  is the mean raw estimated factor score for individuals with an IMV equal to the mid-point of the response scale of the ISCED level 2 population for the TALIS core survey and TKS, or in the case of TALIS Starting Strong ISCED level 02,  $\sigma_{F^*}$  is the standard deviation of the factor score of ISCED level 2 in the case of the TALIS core survey and TKS, or ISCED level 02 for the TALIS Starting Strong population.

By subtracting  $\bar{F}_M^*$ , the standardised scale scores are shifted so that the scale score average is 10 for those individuals from the target population with an IMV equal to the mid-point of the response scale. This allows

for easier interpretation of scale score: scores above 10 suggest positive evaluation of the construct (e.g. agreement, of more importance), scores below 10 suggest negative evaluation of the construct (e.g. disagreement, of lesser importance), while scores of exactly 10 suggest indifference.

**Figure 11.1. Illustration of the mid-point of a scale's items**

**80. How strongly do you agree or disagree with these statements about your experiences as a teacher?**

*Please mark one choice in each row.*

a) I like the subject(s) that I teach. ....

b) I often feel happy while I teach. ....

c) I generally teach with enthusiasm. ....

d) The interesting challenges of teaching give me satisfaction. ....

Mid-point = 2.5

| Strongly disagree                     | Disagree                              | Agree                                 | Strongly agree                        |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> |
| <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> |
| <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> |
| <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> |

Disagreement

Agreement

Table 11.5 provides an example of this procedure for the scale T4JOYTCH. The column on the left shows all possible IMVs for individuals when aggregating the responses to the four items of the scale. The column on the right shows the mean factor score of individuals from the target population with the corresponding IMV. As shown, individuals with an IMV of 2.5 have an average scale score of 10. In general, these means rise as the IMV rises and fall as the IMV falls. The values used for standardisation for each scale are presented in Table 11.7 and Table 11.8.

**Table 11.5. Item mean-scale score equivalence table for the scale *Joy of teaching* (T4JOYTCH)**

| Item mid-point value | Scaled score T4JOYTCH |
|----------------------|-----------------------|
| 1.00                 | 6.39                  |
| 1.25                 | 7.02                  |
| 1.50                 | 7.55                  |
| 1.67                 | 8.43                  |
| 1.75                 | 8.15                  |
| 2.00                 | 8.80                  |
| 2.25                 | 9.31                  |
| 2.33                 | 9.55                  |
| 2.50                 | 10.00                 |
| 2.67                 | 10.62                 |
| 2.75                 | 10.90                 |
| 3.00                 | 12.25                 |
| 3.25                 | 13.22                 |
| 3.33                 | 13.43                 |
| 3.50                 | 14.19                 |
| 3.67                 | 14.71                 |
| 3.75                 | 15.10                 |
| 4.00                 | 16.31                 |

Source: OECD, TALIS 2024 database.

### Composite scale scores

Among the scales created for the TALIS 2024 dataset, there are also some that represent overall constructs based on different scales. Usually, they pertain to multidimensional constructs that are defined as the combination of two or more components (e.g. the teachers' composite job satisfaction score is composed of two subscales: teachers' job satisfaction with the work environment and teachers' job satisfaction with the profession).

As the analyses were based on unidimensional CFA models only, sometimes no good model fit could be achieved for multidimensional constructs. Therefore, the scale scores for multidimensional scale's subscales were calculated as other unidimensional scale scores detailed in the above two subsections. Composite scores were computed by taking a simple average of the corresponding scale scores of the subscales. The computation of the composite scores for individual  $i$  can be summarised as follows:

$$Y_i = \frac{\sum_{j=1}^N x_{ij}}{N}$$

where  $Y_i$  is the composite score for a certain multidimensional scale for individual  $i$ ,  $x_{ij}$  are the raw scale scores of the subscale  $j$  for individual  $i$ , and  $N$  is the number of subscales of this multidimensional scale.

It is worth noting that creating a composite score for a multidimensional construct relies on an auxiliary measurement theory that makes certain assumptions. Composite scores measuring job satisfaction, for example, rely on a logic of formative indicators rather than reflective ones. This measurement logic does not assume unidimensionality or interchangeability of items. Due to issues with model identification, the assumptions of reflective models are difficult to test empirically – see for example Edwards and Bagozzi (2000<sup>[30]</sup>).

These scores were then standardised in the same manner as described in sub-section "Scale score standardisation". The mid-point shift was not applied to composite scores. In these cases,  $\bar{F}^*$  was used instead of  $\bar{F}_M^*$ .  $\bar{F}^*$  is the mean of the scale score of ISCED level 2 in the case of the TALIS core survey and TKS, or ISCED level 02 for TALIS Starting Strong. As a result, composite scale scores have a mean of 10 and a standard deviation of 2.

The scales computed as composites are listed in Table 11.6. The mean scores, standard deviations and IMV shifts for each scale are presented in Table 11.7 and Table 11.8.

**Table 11.6. Composite scale scores across components**

| Component             | Level                     | Respondent | Scale     | Sub-scales                |
|-----------------------|---------------------------|------------|-----------|---------------------------|
| TALIS core survey     | ISCED 1, ISCED 2, ISCED 3 | Teachers   | T4SELF    | T4SEENG, T4SEINS, T4SECLS |
|                       |                           |            | T4JOBSAT  | T4JSENV, T4JSPROT         |
|                       |                           | Principals | T4PJOBSAT | T4PJSPRO, T4PJSENV        |
| TALIS Starting Strong | ISCED 02, U3              | Staff      | S2STRESR  | S2STRESC, S2STRESO        |
|                       |                           | Leaders    | S2LSTRES  | S2LSTRESG, S2LSTRESP      |

**Table 11.7. International mean, standard deviation and scale score corresponding to the IMV for the calibration sample for the TALIS core survey and TKS**

| Respondent | Scale     | $\bar{F}^*$ | $\sigma_{F^*}$ | $\bar{F}_M^*$ |
|------------|-----------|-------------|----------------|---------------|
| Principal  | T4PACADT  | -0.044      | 0.792          | -0.500        |
|            | T4PATBRCC | 0.023       | 0.842          | 0.567         |
|            | T4PDELI   | 0.021       | 0.855          | 0.466         |
|            | T4PDIVBF  | -0.132      | 0.726          | -0.880        |

| Respondent | Scale      | $\bar{F}^*$ | $\sigma_{F^*}$ | $\bar{F}_M^*$ |
|------------|------------|-------------|----------------|---------------|
|            | T4PINBRCC  | 0.023       | 0.832          | 0.453         |
|            | T4PJSENV   | -0.053      | 0.772          | -0.698        |
|            | T4PJSPROT  | -0.017      | 0.841          | -0.406        |
|            | T4PLEADESE | -0.009      | 0.850          | -0.292        |
|            | T4PLEADS   | 0.007       | 0.817          | 0.091         |
|            | T4POPPART  | -0.023      | 0.844          | -0.331        |
|            | T4PTLEAD   | -0.009      | 0.859          | -0.312        |
|            | T4PWELS    | 0.024       | 0.868          | 0.211         |
|            | T4PWLOAD   | -0.007      | 0.816          | 0.157         |
|            | T4PJJOBSAT | -0.070      | 1.404          |               |
| Teacher    | T4ADLE     | -0.022      | 0.879          | -1.150        |
|            | T4ADVDR    | -0.001      | 0.886          | -0.343        |
|            | T4AUTCH    | -0.028      | 0.863          | -1.052        |
|            | T4BLFDRT   | -0.020      | 0.905          | -0.900        |
|            | T4CHFAT    | 0.030       | 0.909          | 0.706         |
|            | T4CLAIN    | -0.035      | 0.824          | -1.224        |
|            | T4CLASM    | -0.048      | 0.847          | -0.747        |
|            | T4CLIBUL   | -0.036      | 0.829          | -1.626        |
|            | T4CLSDIS   | 0.069       | 0.840          | 1.023         |
|            | T4COGAC    | 0.004       | 0.858          | -0.080        |
|            | T4COLES    | 0.006       | 0.811          | 0.415         |
|            | T4COMSEL   | -0.024      | 0.853          | -0.951        |
|            | T4DRTIIA   | 0.009       | 0.900          | 0.246         |
|            | T4DRTWCI   | 0.011       | 0.869          | 0.331         |
|            | T4EMPS     | -0.050      | 0.853          | -1.233        |
|            | T4EXINF    | -0.010      | 0.853          | -0.481        |
|            | T4FULFIL   | -0.014      | 0.892          | -1.079        |
|            | T4GROMST   | -0.010      | 0.904          | -0.373        |
|            | T4INSTLE   | -0.054      | 0.845          | -1.157        |
|            | T4JOYTCH   | -0.059      | 0.829          | -1.734        |
|            | T4JSENV    | -0.028      | 0.844          | -0.806        |
|            | T4JSPROT   | -0.016      | 0.869          | -0.930        |
|            | T4MOPU     | -0.050      | 0.799          | -1.045        |
|            | T4MOSU     | -0.068      | 0.778          | -1.332        |
|            | T4OPPART   | -0.020      | 0.891          | -0.720        |
|            | T4PBLE     | -0.011      | 0.887          | -0.793        |
|            | T4PDBR     | 0.003       | 0.797          | 0.211         |
|            | T4PDGENP   | -0.003      | 0.903          | -0.089        |
|            | T4PDIV     | -0.007      | 0.860          | -0.132        |
|            | T4PDSUBMP  | 0.007       | 0.883          | 0.062         |
|            | T4RELEAD   | -0.039      | 0.869          | -1.199        |
|            | T4SECLS    | -0.042      | 0.847          | -1.254        |
|            | T4SEDRT    | -0.029      | 0.901          | -0.678        |
|            | T4SEENG    | -0.030      | 0.860          | -0.974        |
|            | T4SEINS    | -0.030      | 0.848          | -1.264        |
|            | T4SEMUL    | -0.024      | 0.889          | -0.717        |
|            | T4SESDEV   | -0.027      | 0.888          | -0.958        |
|            | T4SESEN    | -0.001      | 0.920          | -0.254        |
|            | T4STBEH    | 0.007       | 0.825          | 0.359         |
|            | T4STESE    | -0.009      | 0.912          | -0.311        |
|            | T4STUD     | -0.019      | 0.862          | -1.603        |

| Respondent | Scale    | $\bar{F}^*$ | $\sigma_{F^*}$ | $\bar{F}_M^*$ |
|------------|----------|-------------|----------------|---------------|
|            | T4STUHAR | 0.016       | 0.885          | 0.653         |
|            | T4TCHCLC | -0.006      | 0.902          | -0.389        |
|            | T4TLEAD  | -0.023      | 0.900          | -1.068        |
|            | T4VALP   | 0.018       | 0.878          | 0.409         |
|            | T4WELS   | 0.034       | 0.858          | 0.381         |
|            | T4WLOADT | 0.008       | 0.879          | 0.244         |
|            | T4JOBSAT | -0.044      | 1.485          |               |
|            | T4SELF   | -0.102      | 2.220          |               |

**Table 11.8. International mean, standard deviation and scale score corresponding to the IMV for the calibration sample for TALIS Starting Strong**

| Respondent | Scale      | $\bar{F}^*$ | $\sigma_{F^*}$ | $\bar{F}_M^*$ |
|------------|------------|-------------|----------------|---------------|
| Leader     | S2LDLEAD   | -0.006      | 0.855          | -0.167        |
|            | S2LEADSPL1 | 0.007       | 0.875          | 0.148         |
|            | S2LEADSPL2 | 0.005       | 0.856          | 0.430         |
|            | S2LJOBSAR  | -0.022      | 0.795          | -0.535        |
|            | S2LNIGHBR  | 0.022       | 0.882          | 0.728         |
|            | S2LOPPART  | 0.009       | 0.780          | 0.214         |
|            | S2LPDEV    | -0.001      | 0.972          | -0.058        |
|            | S2LPDLS    | -0.012      | 0.871          | -0.185        |
|            | S2LPDPL    | 0.001       | 0.962          | -0.003        |
|            | S2LSQPRS   | 0.038       | 0.815          | 0.322         |
|            | S2LSQSET   | -0.035      | 0.864          | -0.753        |
|            | S2LSQSTA   | 0.023       | 0.900          | 0.602         |
|            | S2LSTRESG  | 0.008       | 0.770          | 0.167         |
|            | S2LSTRESL  | 0.029       | 0.865          | 0.330         |
|            | S2LSTRESP  | -0.002      | 0.874          | 0.190         |
|            | S2LSTRES   | 0.045       | 1.441          |               |
| Staff      | S2CCAFL    | -0.022      | 0.865          | -0.531        |
|            | S2COLLR    | -0.008      | 0.873          | -0.453        |
|            | S2JOBSAR   | -0.045      | 0.825          | -1.157        |
|            | S2PAAD     | 0.013       | 0.901          | 0.366         |
|            | S2PAREN    | 0.004       | 0.906          | -0.404        |
|            | S2PDIVR    | -0.003      | 0.886          | -0.177        |
|            | S2PDNPED   | 0.007       | 0.940          | 0.101         |
|            | S2PRACTR   | -0.021      | 0.901          | -0.773        |
|            | S2PREMR    | -0.145      | 0.747          | -1.104        |
|            | S2PRINTR   | -0.045      | 0.797          | -0.847        |
|            | S2PRLANR   | -0.017      | 0.914          | -1.200        |
|            | S2PROLIR   | -0.005      | 0.901          | -0.441        |
|            | S2PRONUR   | 0.008       | 0.905          | -0.007        |
|            | S2PROSAR   | -0.063      | 0.768          | -1.042        |
|            | S2PRSOC    | -0.144      | 0.738          | -1.354        |
|            | S2SELF     | -0.009      | 0.928          | -0.404        |
|            | S2SELF     | -0.039      | 0.865          | -0.676        |
|            | S2SOCIALR  | -0.034      | 0.870          | -1.350        |
|            | S2SSLEAD   | -0.038      | 0.902          | -1.072        |
|            | S2STRESC   | 0.005       | 0.868          | 0.281         |
|            | S2STRESO   | -0.004      | 0.858          | 0.189         |



| Respondent | Scale    | $\bar{F}^*$ | $\sigma_{F^*}$ | $\bar{F}_M^*$ |
|------------|----------|-------------|----------------|---------------|
|            | S2STRESS | 0.038       | 0.852          | 0.472         |
|            | S2STRESR | 0.001       | 1.556          |               |

### *Recommendation for analysis and interpretation*

To determine the type of analysis that can be conducted with scale scores, it is essential to know how they were computed. Since its first cycle, TALIS focuses on providing information on scale comparability across country/territory. In 2008 and 2018, scale scores were constructed based on their measurement invariance level (OECD, 2019<sup>[26]</sup>; OECD, 2019<sup>[27]</sup>; OECD, 2010<sup>[28]</sup>). In 2013, the scale scores were constructed using a common international model for all countries/territories (OECD, 2014<sup>[22]</sup>). The strategy of the 2013 cycle was applied in the current cycle as well. Scale scores for all countries/territories were constructed using parameters based on the international pooled dataset, facilitating scale score comparability across all countries/territories. In general, scale scores created for TALIS 2024 can be used in different types of analyses, including comparisons of country/territory means for each individual scale. The results of specific scales, including cautionary notes about limitations, are presented in the next sections.

The scaling process for each scale was independent, and scale score standardisation was done separately. Even though the metric had the same units, the scale scores are not linked between different scales. Therefore, direct mean comparisons across different scales are not meaningful. This is also true for comparisons of scale scores across cycles. Traditionally, scales in TALIS are not constructed in a way that they would allow trend comparison. Therefore, TALIS 2024 scale scores are not comparable to previous TALIS cycles.

Sometimes the same items are part of more than one scale. This is, for example, the case for some “overall” scales that are further split into subscales. The scale results come from different unidimensional models and the “overall” scale shares items (and variation) with its subscales. Another example are scales that are created as an average of other scales. When analysing these scale scores together, researchers should keep in mind that the shared variance affects the results. There is an additional limitation pertaining only to composite scale scores. The composite scores could be biased because of the weight of the subscale on the latent construct not being taken into account (i.e. assumed to be equal for all subscales).

Even though the scales in TALIS Starting Strong were created using ISCED level 02 international parameters, specific attention was paid to the results of the U3 level as well. In some cases, the same scale composition could not be confirmed in the U3 population. In these cases, scale scores were computed only for ISCED level 02. Furthermore, in one scale, the model fit in the U3 population was exceeding the acceptable values. In this case, it is advised that the scale scores be used with caution. The specifics of the scales that are relevant for analyses are presented in Table 11.9.

**Table 11.9. Specifics of scales across components**

| Component             | Level                     | Respondent | Scale    | Specific                                                                            |
|-----------------------|---------------------------|------------|----------|-------------------------------------------------------------------------------------|
| TALIS core survey     | ISCED 1, ISCED 2, ISCED 3 | Teachers   | T4PDIV   | Shares item TT4G24J with scale T4PDGENP                                             |
|                       |                           |            | T4PDGENP | Shares item TT4G24J with scale T4PDIV                                               |
| TALIS Starting Strong | ISCED 02, U3              | Staff      | S2SELF   | Shares items SS2G24B, SS2G24C, SS2G24F, SS2G24G, SS2G24I, SS2G24J with scale S2SELF |
|                       |                           |            | S2SELF   | Shares items SS2G24B, SS2G24C, SS2G24F, SS2G24G, SS2G24I, SS2G24J with scale S2SELF |
|                       |                           | Leaders    | S2LPDLS  | Only available for ISCED 02                                                         |
|                       |                           |            | S2LSQSTA | Only available for ISCED 02                                                         |

### Cross-country/territory comparability

The scale scores for all scales included in TALIS 2024 are calculated using the same international model parameters and are constructed to be statistically equivalent across countries/territories and populations. An important consideration when using the scale scores in analysis is the results of the cross-country/territory measurement invariance testing. The TALIS 2024 strategy of measurement invariance testing is described in the section “Measurement invariance analysis and model evaluation across countries/territories”. Of note, the cut-off thresholds reported and used in the literature were established under different conditions and contexts than those in TALIS 2024. Specifically, there are a larger number of groups, with varying numbers of items included in a scale, and with different number of response categories across scales. For this reason, the cut-off values reported in the literature were used as guidelines when evaluating the results of MGCFA models.

All of the scales presented in this report and included in the international database exhibited at least an acceptable baseline model fit. In addition, for the constrained loadings models, a noticeable drop in model fit compared to the baseline models was not observed. These results establish the basic level of comparability of constructs across the included countries/territories. For many of the scales, an acceptable drop in model fit can be further observed when comparing the model where trained loadings and thresholds across countries/territories were constrained to the model with equal loadings only. These results support the comparability of scale scores across countries/territories and the use of scale scores in various types of analyses including regression analysis and comparisons of means across countries/territories.

The results of measurement invariance testing for each of the scales are included in the section “Results from scales evaluation”. A note was added to scales for which comparisons of scale scores need to be interpreted with caution. This applies when the most constrained model exhibited a poor fit or a large drop in fit compared to the less constrained model. Similar to scale scores that are constructed as partially invariant, meaning they allow for a certain number of country-specific parameters, these scale scores contain some noise. Using the selected procedure, it is difficult to quantify the exact amount of noise within these scale scores. However, given that the scale evaluation results are mostly acceptable, results from analyses using these scale scores can be useful as well. To remind users that complete comparability was not established for certain scales, a summary of these notes is provided in Table 11.10 for TALIS core survey and TKS and in Table 11.11 for TALIS Starting Strong.

Finally, as scale scores are optimised for use by most countries/territories, the selected international models may not always be the most optimal for a single country/territory. Therefore, in addition to the results based on the pooled international data, results for each country/territory are presented as well. To highlight cases where the international models do not work well in single countries/territories, we also provide notes in Table 11.10 for TALIS core survey and TKS and in Table 11.11 for TALIS Starting Strong. For these scales, scale score comparisons should also be interpreted carefully, as the scores may have a slightly different meaning in each country/territory.

## 11.4. Results from scales evaluation

The remainder of this chapter presents the results of the TALIS 2024 questionnaire scales, organised into three main sections: TALIS core survey, TALIS Starting Strong and TKS. Each section is further divided by instrument. Within the core survey section, the results for the teacher questionnaire scales are presented first, followed by the principal questionnaire scales. For TALIS Starting Strong, the results for the staff questionnaire scales are presented first, followed by those for the leader questionnaire scales. The chapter is closed with the results of the TKS context questionnaire scales.

The results for each scale are described in a dedicated subsection. Each of them begins with an overview of the question and items used in the scale, including the item names, item wording and the response

categories used for scaling, together with the scale mid-point. Where applicable, any items that were reverse coded or scales for which response categories were collapsed for scale construction purposes are noted. The results for scale reliability and model fit results across all participating countries/territories for each ISCED level are then presented. For scales based on three items, only scale reliability results are reported. This is followed by the results of measurement invariance testing for ISCED level 2, in the case of the TALIS core survey, and ISCED level 02 and U3 in the case of TALIS Starting Strong. The measurement invariance tables show model fits for the baseline, equal loadings and equal loadings and threshold models, as well as the difference in model fits between a more restricted model and a less restricted model. For example, the difference between equal loadings and baseline models is displayed as  $\Delta$  CFI,  $\Delta$  TLI,  $\Delta$  RMSEA and  $\Delta$  SRMR in the row of equal loadings model. Each scale subsection concludes with the item loadings and thresholds from the final models, based on the pooled international data, which were used to construct the final scale scores. In the text, items that exhibited low loadings in individual countries/territories are pointed out.

A full description of the criteria for interpreting the results (i.e. reliability, model fit, measurement invariance, item loadings)<sup>2</sup> can be found in the section “Scale analysis”. The main criteria to interpret the scale evaluation results presented in the next sections are focusing on reliability, CFA model fits (based on pooled and single country/territory datasets), factor loadings and MGCFA model fits with different restrictions.

Specifically for MGCFA, all of the cut-off criteria were used as guidelines and a more lenient approach was applied, recognising that the cut-off criteria were established under circumstances different to large-scale assessments with many groups.

It is also important to note that some indices were created as composites of multiple subscales. These aggregated indices are not described in the following sections; only the subscales are presented.

For the TALIS core survey, the composite scales are:

- teacher self-efficacy, overall (T4SELF), created as the average of the self-efficacy in student engagement (T4SEENG), self-efficacy in instruction (T4SEINS) and self-efficacy in classroom management (T4SECLS) scales (this scale is also available for TKS)
- job satisfaction, overall (T4JOBSAT), created as the average of the job satisfaction with profession (T4JSPROT) and job satisfaction with work environment (T4JSENV) scales
- job satisfaction, overall (principal) (T4PJJOBSAT), created as the average of the job satisfaction with profession (principal) (T4PJSPROT) and job satisfaction with work environment (principal) (T4PJSENV) scales.

For TALIS Starting Strong, the composite scales are:

- sources of work stress, overall (S2STRESR), created as the average of the aspects specific to children’s development, well-being and learning (S2STRESC) and aspects related to capacity, resources and time (S2STRESO) scales
- sources of work stress, overall (leader) (S2LSTRES), created as the average of the sources of work stress associated with general leadership concerns (S2LSTRESG) and sources of work stress associated with pedagogical leadership (S2LSTRESP) scales.

Except for the composite scales mentioned above, all other TALIS 2024 scales are presented in Table 11.10 (for the TALIS core survey and TKS) and Table 11.11 (for TALIS Starting Strong), listed by their scale label and variable name as found in the international database. Additional comments are provided indicating which scales in which countries/territories need to be interpreted and used with caution. This evaluation takes into account the measurement invariance testing results and the single country/territory results, which cover both scale reliability and CFA model fit. For the single country/territory results, attention is drawn to countries/territories that showed poor outcomes on more than two statistics<sup>3</sup>.

In the overview tables, the column “Notes on scale performance” points to the scales and/or countries/territories where specific scale results were poor. A distinction is made between two different levels of caution for cross-country/-territory comparability:

- When considerably poor model fit based on most of the fit indices for the equal loadings and thresholds model are observed, particular caution must be made when interpreting the scale results. In the table, we denote this with the note: “Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.”
- When the equal loadings and thresholds model exhibited a large drop compared to the equal loadings model but the absolute value of two indices does not exceed the cut-off thresholds, some caution in using the scale scores across countries is advised. This is denoted by the following note: “Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.”

In both cases, the scale scores contain some degree of noise. However, with the selected procedure we cannot quantify the exact amount of noise within these scale scores. Since the other scale evaluation results are generally acceptable, analyses using these scale scores can still be conducted and may yield useful insights. Nevertheless, it is recommended that the evaluation results are kept in mind when interpreting any findings based on these scale scores. The results from single countries/territories that exhibit poor scale results must be interpreted with considerable caution as there is indication that the selected construct composition does not work.

If a scale has no accompanying note, its scale scores can be used in various types of analysis without the need for specific caution in interpretation.

**Table 11.10. Overview of TALIS core survey and TKS scales**

|                | Scale label                                                                       | Variable name | Notes on scale performance for TALIS core survey                                                                                                                                                                                                                                                                                                          | Notes on scale performance for TKS |
|----------------|-----------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Teacher scales | Need for professional development in subject matter and subject-specific pedagogy | T4PDSUBMP     |                                                                                                                                                                                                                                                                                                                                                           | NA                                 |
|                | Need for professional development in general pedagogy                             | T4PDGENP      | Poor scale results in the Netherlands (ISCED level 1)                                                                                                                                                                                                                                                                                                     | NA                                 |
|                | Need for professional development for teaching for diversity                      | T4PDIV        |                                                                                                                                                                                                                                                                                                                                                           | NA                                 |
|                | Barriers to professional development: lack of support in access                   | T4PDBR        | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution<br><br>Poor reliability in Costa Rica, Iceland, Kosovo and Norway in ISCED level 2; and in the Flemish Community (Belgium) in ISCED level 1 | NA                                 |
|                | Exchange of information and ideas among teachers                                  | T4EXINF       | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution                                                                                                                                             |                                    |

|  | Scale label                                                                      | Variable name | Notes on scale performance for TALIS core survey                                                                                                                                                                                                                                  | Notes on scale performance for TKS |
|--|----------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
|  | Professional collaboration in lessons among teachers                             | T4COLES       | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution                                                                     |                                    |
|  | Self-efficacy in classroom management                                            | T4SECLS       |                                                                                                                                                                                                                                                                                   |                                    |
|  | Self-efficacy in instruction                                                     | T4SEINS       |                                                                                                                                                                                                                                                                                   |                                    |
|  | Self-efficacy in student engagement                                              | T4SEENG       |                                                                                                                                                                                                                                                                                   |                                    |
|  | Self-efficacy in multicultural classrooms                                        | T4SEMUL       |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Growth mindset                                                                   | T4GROMST      |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Self-efficacy in special education needs                                         | T4SESEN       |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Comfort with social and emotional aspects of teaching                            | T4COMSEL      |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Self-efficacy in using digital resources and tools                               | T4SEDRT       |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Beliefs in digital resources and tools                                           | T4BLFDRT      |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Adversity to digital resources and tools                                         | T4ADVDRDRT    |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Student engagement in environmental and sustainability education                 | T4STESE       |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Confidence to teach about climate change                                         | T4TCHCLC      |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Clarity of instruction                                                           | T4CLAIN       |                                                                                                                                                                                                                                                                                   |                                    |
|  | Cognitive activation                                                             | T4COGAC       | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution<br>Poor scale results in the Netherlands and Sweden (ISCED level 2) |                                    |
|  | Classroom management                                                             | T4CLASM       |                                                                                                                                                                                                                                                                                   |                                    |
|  | Use of digital resources and tools for whole class instruction                   | T4DRTWCI      | Comparisons of results across countries/ and territories in results of on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution                                                      | NA                                 |
|  | Use of digital resources and tools for individualised instruction and assessment | T4DRTIIA      |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Perceived classroom disruption                                                   | T4CLSDIS      |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Adaptive learning                                                                | T4ADLE        |                                                                                                                                                                                                                                                                                   |                                    |
|  | Progression-based learning                                                       | T4PBLE        |                                                                                                                                                                                                                                                                                   |                                    |
|  | Autonomy of teaching                                                             | T4AUTCH       |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Fulfilment of lesson aims (complexity of teaching)                               | T4FULFIL      |                                                                                                                                                                                                                                                                                   |                                    |
|  | Empathy with students                                                            | T4EMPS        |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Social and emotional skill development                                           | T4SESDEV      |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Opportunities to participate in school decisions                                 | T4OPPART      |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Teacher leadership                                                               | T4TLEAD       |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Teacher-student relations                                                        | T4STUD        |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Relational leadership                                                            | T4RELEAD      |                                                                                                                                                                                                                                                                                   | NA                                 |
|  | Instructional leadership                                                         | T4INSTLE      |                                                                                                                                                                                                                                                                                   | NA                                 |

|                  | Scale label                                                  | Variable name | Notes on scale performance for TALIS core survey                                                                                                                                                                                                                               | Notes on scale performance for TKS |
|------------------|--------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
|                  | School climate regarding bullying                            | T4CLIBUL      |                                                                                                                                                                                                                                                                                | NA                                 |
|                  | Student harassment in school                                 | T4STUHAR      |                                                                                                                                                                                                                                                                                | NA                                 |
|                  | Change fatigue                                               | T4CHFAT       |                                                                                                                                                                                                                                                                                | NA                                 |
|                  | Personal utility motivations to teach                        | T4MOPU        |                                                                                                                                                                                                                                                                                | NA                                 |
|                  | Social utility motivations to teach                          | T4MOSU        |                                                                                                                                                                                                                                                                                | NA                                 |
|                  | Workplace well-being and stress                              | T4WELS        |                                                                                                                                                                                                                                                                                | NA                                 |
|                  | Workload stress                                              | T4WLOADT      | Comparisons of results across countries/ and territories in results of on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution                                                            |                                    |
|                  | Student behaviour stress                                     | T4STBEH       | Comparisons of results across countries/ and territories in results of on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution<br><br>Poor reliability in Serbia (ISCED level 2) |                                    |
|                  | Job satisfaction with work environment                       | T4JSENV       |                                                                                                                                                                                                                                                                                | NA                                 |
|                  | Job satisfaction with profession                             | T4JSPROT      |                                                                                                                                                                                                                                                                                | NA                                 |
|                  | Perceptions of value and policy influence                    | T4VALP        |                                                                                                                                                                                                                                                                                | NA                                 |
|                  | Joy of teaching                                              | T4JOYTCH      |                                                                                                                                                                                                                                                                                |                                    |
|                  | Opportunities to learn – Assessment                          | KRBASS        | NA                                                                                                                                                                                                                                                                             |                                    |
|                  | Opportunities to learn – Additional pedagogical topics       | KRBEPR        | NA                                                                                                                                                                                                                                                                             |                                    |
|                  | Opportunities to learn – Classroom instruction               | KRBINS        | NA                                                                                                                                                                                                                                                                             |                                    |
|                  | Opportunities to learn – Student learning                    | KRBLEA        | NA                                                                                                                                                                                                                                                                             |                                    |
| Principal scales | Instructional leadership (principal)                         | T4PLEADS      |                                                                                                                                                                                                                                                                                |                                    |
|                  | Teacher leadership (principal)                               | T4PTLEAD      | Poor scale results in Latvia (ISCED level 2)                                                                                                                                                                                                                                   |                                    |
|                  | Opportunities to participate in school decisions (principal) | T4POPPART     | Poor reliability in the Netherlands (ISCED level 1)                                                                                                                                                                                                                            |                                    |
|                  | Academic rigor                                               | T4PACADT      | Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution<br><br>Poor reliability in Croatia and Latvia (ISCED level 2)             |                                    |
|                  | School delinquency and violence                              | T4PDELI       | Comparisons of results across countries/ and territories in results of on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution                                                            |                                    |
|                  | Diversity beliefs                                            | T4PDIVBF      |                                                                                                                                                                                                                                                                                |                                    |
|                  | Leadership in environmental and sustainability education     | T4PLEADESE    | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most                                                                                                                                                 |                                    |

|  | Scale label                                        | Variable name | Notes on scale performance for TALIS core survey                                                                                                                                                                                                                                                                                                                                                                                                                      | Notes on scale performance for TKS |
|--|----------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
|  |                                                    |               | restricted multi-group model and must be interpreted with considerable caution<br>Poor scale results in Denmark and the Slovak Republic (ISCED level 2) and in New Zealand (ISCED level 1)                                                                                                                                                                                                                                                                            |                                    |
|  | Instructional barriers to teaching climate change  | T4PINBRCC     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                    |
|  | Attitudinal barriers to teaching climate change    | T4PATBRCC     | Poor scale results in France and the United States (ISCED level 2)                                                                                                                                                                                                                                                                                                                                                                                                    |                                    |
|  | Workplace well-being and stress (principal)        | T4PWELS       | Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution                                                                                                                                                                                                                                                                  |                                    |
|  | Workload stress (principal)                        | T4PWLOAD      | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution<br>Poor reliability in Czechia, Denmark, France, Italy, Norway, Slovenia and Sweden (ISCED level 2); in Belgium, the Flemish Community (Belgium), France, New Zealand and Spain (ISCED level 1); and in the Flemish Community (Belgium) (ISCED level 3) |                                    |
|  | Job satisfaction with work environment (principal) | T4PJSENV      | Poor reliability in Slovenia (ISCED level 2)                                                                                                                                                                                                                                                                                                                                                                                                                          |                                    |
|  | Job satisfaction with profession (principal)       | T4PJSPROT     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                    |

Table 11.11. Overview of TALIS Starting Strong scales

|              | Scale label                                                    | Variable name | Notes on scale performance                                                                                                                                                                                                                             |
|--------------|----------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Staff scales | Professional development needs: pedagogical                    | S2PDNPED      |                                                                                                                                                                                                                                                        |
|              | Professional development needs: diversity                      | S2PDIVR       |                                                                                                                                                                                                                                                        |
|              | Self-efficacy, overall                                         | S2SELF        |                                                                                                                                                                                                                                                        |
|              | Self-efficacy: children's development, well-being and learning | S2SELF        |                                                                                                                                                                                                                                                        |
|              | Facilitating play                                              | S2PRINTR      |                                                                                                                                                                                                                                                        |
|              | Facilitating prosocial behaviour                               | S2PRSOC       |                                                                                                                                                                                                                                                        |
|              | Facilitating emotional development                             | S2PREMR       |                                                                                                                                                                                                                                                        |
|              | Child-centred planning                                         | S2CCAFL       | Comparisons of results across countries/ and territories in results of on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution for the ISCED level 02 population. |
|              | Daily adaptive pedagogical practices                           | S2PRACTR      | Comparisons of results across countries/ and territories in results of on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution for the ISCED level 02 population. |
|              | Facilitating language development                              | S2PRLANR      |                                                                                                                                                                                                                                                        |
|              | Facilitating literacy development                              | S2PROLIR      | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable                                                  |



|  | Scale label                                                                                 | Variable name | Notes on scale performance                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--|---------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                                             |               | caution for the ISCED level 02 population.<br>Poor scale results in Germany (ISCED level 02 and U3) and in Finland (ISCED level 02).                                                                                                                                                                                                                                                                                                                                                |
|  | Facilitating numeracy development                                                           | S2PRONUR      | Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution for both the ISCED level 02 and U3 populations.                                                                                                                                                                                                                                |
|  | Behavioural support in the classroom/playroom                                               | S2SOCIALR     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|  | Promoting awareness and acceptance of diversity                                             | S2PAAD        | Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution for the ISCED level 02 population.                                                                                                                                                                                                                                             |
|  | Engagement in collaborative practices                                                       | S2COLLR       | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution for the ISCED level 02 population.<br>Poor scale results in Chile (ISCED level 02).                                                                                                                                                                                   |
|  | Facilitating parent/guardian engagement                                                     | S2PARENUR     | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution for the ISCED level 02 population.<br><br>Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution for the U3 population. |
|  | Satisfaction with setting leadership                                                        | S2SSLEAD      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|  | Satisfaction with profession                                                                | S2PROSAR      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|  | Satisfaction with work at this early childhood education and care (ECEC) setting            | S2JOBSAR      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|  | Sources of work stress: aspects specific to children's development, well-being and learning | S2STRESC      | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution for both the ISCED level 02 and U3 populations.<br><br>Poor scale results in Germany (ISCED level 02).                                                                                                                                                                |
|  | Sources of work stress: aspects related to capacity, resources and time                     | S2STRESO      | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution for the ISCED level 02 population.<br><br>Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution for the U3 population. |

|               | Scale label                                                                       | Variable name | Notes on scale performance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------|-----------------------------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | Level of stress and its impact on staff well-being                                | S2STRESS      | <p>Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution for the ISCED level 02 population.</p> <p>Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution for the U3 population.</p> <p>Poor scale reliability in Norway (ISCED level 02, U3).</p> |
| Leader scales | Professional development needs, overall                                           | S2LPDEV       | Poor scale results in the Flemish Community (Belgium) (ISCED level 02 and U3), Germany (ISCED level 02 and U3) and New Zealand (U3)                                                                                                                                                                                                                                                                                                                                                                                                                      |
|               | Professional development needs: leadership and setting management (ISCED 02 only) | S2LPDLS       | Poor scale results in New Zealand                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|               | Professional development needs: pedagogy and pedagogical leadership               | S2LPDPL       | Poor scale results in the Flemish Community (Belgium) (ISCED level 02 and U3), Germany (ISCED level 02) and New Zealand (ISCED level 02 and U3)                                                                                                                                                                                                                                                                                                                                                                                                          |
|               | Neighbourhood environment                                                         | S2LNIGHBR     | Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution for the ISCED level 02 population.                                                                                                                                                                                                                                                                                                                  |
|               | Structural quality: adequacy of setting                                           | S2LSQSET      | Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution for the ISCED level 02 population.                                                                                                                                                                                                                                                                                                                  |
|               | Barriers to structural quality: adequacy of physical resources                    | S2LSQPRS      | Poor scale results in the Flemish Community (Belgium) (ISCED level 02)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|               | Barriers to structural quality: adequacy of staffing (ISCED 02 only)              | S2LSQSTA      | <p>Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.</p> <p>Poor scale results in New Zealand</p>                                                                                                                                                                                                                                                                                                    |
|               | Leader support for staff in pedagogical learning                                  | S2LEADSPL1    | Poor scale results in Norway (U3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|               | Leader innovations in the ECEC setting                                            | S2LEADSPL2    | Poor reliability in Germany (ISCED level 02 and U3).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|               | Distributed leadership                                                            | S2LDLEAD      | <p>Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution for both the ISCED level 02 and U3 populations.</p> <p>Poor scale results in Colombia, Finland and Ireland (ISCED level 02).</p>                                                                                                                                                                                                        |
|               | Satisfaction with work at this ECEC setting                                       | S2LJOBSAR     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|               | Level of stress and impact on leaders' well-being                                 | S2LSTRESL     | <p>Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution for both the ISCED level 02 and U3 populations.</p> <p>Poor scale results in Norway (ISCED level 02 and U3) and New Zealand (U3).</p>                                                                                                                                                                                                            |

|  | Scale label                                                        | Variable name | Notes on scale performance                                                                                                                                                                                                                                                                                              |
|--|--------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Sources of work stress associated with pedagogical leadership      | S2LSTRESP     | Comparisons of results across countries and territories on scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution for both the ISCED level 02 and U3 populations.<br>Poor scale results in Ireland, Norway and New Zealand (U3). |
|  | Sources of work stress associated with general leadership concerns | S2LSTRESG     | Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution for both the ISCED level 02 and U3 populations.<br>Poor scale results in New Zealand (ISCED level 02).    |

### 11.4.1. TALIS core survey

#### *Complex scales from the teacher questionnaire*

#### **Need for professional development in subject matter and subject-specific pedagogy (T4PDSUBMP)**

Three separate scales were constructed from statements in TQ 24, where teachers were asked to indicate the extent to which they currently need professional learning activities in different areas. For each area, they selected from the following response options: “No need at present”, “Low level of need”, “Moderate level of need” or “High level of need”. Responses to three of the items in this question (TT4G24A, TT4G24B, TT4G24C) were used to derive a scale reflecting teachers’ *Need for professional development in subject matter and subject-specific pedagogy* (T4PDSUBMP). Higher values on this scale indicate a greater need for professional development.

Table 11.12 provides the item names as used in the dataset, question stem and response options for the items belonging to this scale, as well as the scale mid-point.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.13. The fit indices for the T4PDSUBMP scale are not presented here as the scale was measured by just three items, resulting in a model that is just identified and therefore shows a perfect fit. The scale T4PDSUBMP has high reliability (above 0.700) in all participating countries/territories in all populations.

Table 11.14 presents the results from the measurement invariance testing for T4PDSUBMP for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. In the equal loadings model, the CFI, TLI and SRMR are within the cut-off criteria, whereas the RMSEA is above the cut-off value. The degree of change between the equal loadings and the equal thresholds and loadings models is within the cut-off criteria for the TLI and RMSEA for ISCED level 2. No specific caution is required when comparing scale score results across countries/territories.

Table 11.15 reports the standardised item loadings and thresholds based on pooled data for scale T4PDSUBMP. The loadings for all of the items are high for the pooled model as well as in single countries/territories.

**Table 11.12. Items and response categories used in the construction of scale T4PDSUBMP**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                 |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4PDSUBMP     | For each of the areas listed below, please indicate the extent to which you currently need professional learning activities<br><i>Recoded response categories for scaling: 1=No need at present; 2=Low level of need; 3=Moderate level of need; 4=High level of need</i> |
|               | Scale mid-point: 2.5                                                                                                                                                                                                                                                     |
| TT4G24A       | Knowledge and understanding of my subject field(s)                                                                                                                                                                                                                       |
| TT4G24B       | The pedagogy of the subject matter(s) I teach                                                                                                                                                                                                                            |
| TT4G24C       | Knowledge of the curriculum                                                                                                                                                                                                                                              |

Source: OECD, TALIS 2024 database.

**Table 11.13. Reliability coefficient alpha for single countries and pooled model for scale T4PDSUBMP**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.923                           |
| Alberta (Canada)                | 0.882                           |
| Australia                       | 0.887                           |
| Austria                         | 0.722                           |
| Azerbaijan                      | 0.872                           |
| Bahrain                         | 0.947                           |
| Belgium                         | 0.826                           |
| Flemish Community (Belgium)     | 0.842                           |
| French Community (Belgium)      | 0.814                           |
| Brazil                          | 0.927                           |
| Bulgaria                        | 0.971                           |
| Chile                           | 0.902                           |
| Colombia                        | 0.903                           |
| Costa Rica                      | 0.896                           |
| Croatia                         | 0.915                           |
| Cyprus                          | 0.922                           |
| Czechia                         | 0.751                           |
| Denmark                         | 0.762                           |
| Estonia                         | 0.818                           |
| Finland                         | 0.836                           |
| France                          | 0.804                           |
| Hungary                         | 0.875                           |
| Iceland                         | 0.801                           |
| Israel                          | 0.896                           |
| Italy                           | 0.822                           |
| Japan                           | 0.892                           |
| Kazakhstan                      | 0.941                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Korea                           | 0.952                           |
| Kosovo                          | 0.894                           |
| Latvia                          | 0.873                           |
| Lithuania                       | 0.862                           |
| Malta                           | 0.895                           |
| Montenegro                      | 0.934                           |
| Morocco                         | 0.925                           |
| Netherlands                     | 0.826                           |
| New Zealand                     | 0.867                           |
| North Macedonia                 | 0.944                           |
| Norway                          | 0.792                           |
| Poland                          | 0.877                           |
| Portugal                        | 0.870                           |
| Romania                         | 0.948                           |
| Saudi Arabia                    | 0.937                           |
| Serbia                          | 0.943                           |
| Shanghai (China)                | 0.959                           |
| Singapore                       | 0.913                           |
| Slovak Republic                 | 0.815                           |
| Slovenia                        | 0.925                           |
| South Africa                    | 0.954                           |
| Spain                           | 0.825                           |
| Sweden                          | 0.826                           |
| Türkiye                         | 0.912                           |
| United Arab Emirates            | 0.957                           |
| United States                   | 0.930                           |
| Uzbekistan                      | 0.901                           |
| Viet Nam                        | 0.949                           |
| International pooled data       | 0.911                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.890                           |
| Belgium                         | 0.833                           |
| Flemish Community (Belgium)     | 0.871                           |
| French Community (Belgium)      | 0.772                           |
| Brazil                          | 0.916                           |
| France                          | 0.816                           |
| Japan                           | 0.883                           |
| Korea                           | 0.959                           |
| Morocco                         | 0.924                           |
| Netherlands                     | 0.835                           |
| New Zealand                     | 0.870                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Saudi Arabia                    | 0.954                           |
| Slovenia                        | 0.938                           |
| Spain                           | 0.832                           |
| Türkiye                         | 0.929                           |
| United Arab Emirates            | 0.938                           |
| International pooled data       | 0.909                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.902                           |
| Denmark                         | 0.784                           |
| Flemish Community (Belgium)     | 0.824                           |
| Portugal                        | 0.852                           |
| Saudi Arabia                    | 0.946                           |
| Slovenia                        | 0.916                           |
| Türkiye                         | 0.896                           |
| United Arab Emirates            | 0.953                           |
| International pooled data       | 0.901                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.14. Measurement invariance results from MGCFA for scale T4PDSUBMP with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.995     | 0.993 | 0.130 | 0.019 | -0.005                  | -0.007 | 0.130   | 0.019  |
| Equal loadings and thresholds | 0.987     | 0.994 | 0.119 | 0.094 | -0.009                  | 0.001  | -0.011  | 0.075  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.15. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PDSUBMP**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G24A | 0.920   | -0.761      | 0.099       | 0.995       |
| TT4G24B | 0.918   | -0.931      | -0.015      | 0.955       |
| TT4G24C | 0.822   | -0.770      | 0.109       | 0.978       |

Source: OECD, TALIS 2024 database.

### Need for professional development in general pedagogy (T4PDGENP)

A second scale was constructed from statements of TQ 24. Teachers were asked to indicate the extent to which they currently need professional learning activities in different areas. For each area, they selected from the following response options: “No need at present”, “Low level of need”, “Moderate level of need” or “High level of need”. Responses to four of the items in this question (TT4G24D, TT4G24H, TT4G24M, TT4G24J) were used to derive a scale reflecting teachers’ *Need for professional development in general pedagogy* (T4PDGENP). Higher values on these scales indicate a greater need for professional development. Table 11.16 provides the item names, question stem, item statements and response options for the items belonging to this scale, as well as the scale mid-point.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.17. The scale T4PDGENP has high reliability (above 0.700) in all populations. As can be observed from Table 11.17, the CFI for T4PDGENP meets the acceptable cut-off for all participants in all populations, except for the ISCED level 1 population in the Netherlands. The TLI does not meet the cut-off criterion in Belgium ISCED level 2, the Flemish Community of Belgium for both ISCED levels 2 and 3, the Netherlands for both ISCED levels 1 and 2, and the ISCED level 1 population in France and New Zealand. The RMSEA exceeds the cut-off criterion in most participating countries or territories. In 28 of these, the RMSEA is between 0.100 and 0.140; in 20 is between 0.141 and 0.200, and in 6 is above 0.201 (the ISCED level 2 population in Malta, the ISCED level 1 population in Australia, New Zealand, France and Slovenia and the ISCED level 3 population in the Flemish Community of Belgium). Finally, the SRMR is within the cut-off criterion across all populations. Based on the single CFA model fit results, the scale T4PDGENP works well across all populations except in the Netherlands (ISCED level 1), where the CFI, TLI and RMSEA do not meet the acceptable cut-off criteria.

Table 11.18 presents the results from the measurement invariance testing for T4PDGENP for ISCED level 2. All indices, except the RMSEA, are within the cut-off criteria in the baseline invariance model. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA and SRMR. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criteria for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.19 presents the standardised item loadings and thresholds based on pooled data for scale T4PDGENP. The loadings for all of the items are high. Results by participating country/territory show a low loading for item TT4G24H in the Flemish Community of Belgium (ISCED level 2) and in the Netherlands (ISCED level 1).

**Table 11.16 Items and response categories used in the construction of scale T4PDGENP**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                 |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4PDGENP      | For each of the areas listed below, please indicate the extent to which you currently need professional learning activities<br><i>Recoded response categories for scaling: 1=No need at present; 2=Low level of need; 3=Moderate level of need; 4=High level of need</i> |
|               | Scale mid-point: 2.5                                                                                                                                                                                                                                                     |
| TT4G24D       | Student assessment practices                                                                                                                                                                                                                                             |
| TT4G24H       | Classroom management for student behaviour                                                                                                                                                                                                                               |
| TT4G24J       | Approaches to individualised learning                                                                                                                                                                                                                                    |
| TT4G24M       | Analysis and use of student assessments                                                                                                                                                                                                                                  |

Source: OECD, TALIS 2024 database.



**Table 11.17. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4PDGENP**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |              |              |       |
| Albania                         | 0.935            | 1.000         | 0.999        | 0.045        | 0.004 |
| Alberta (Canada)                | 0.855            | 0.986         | 0.957        | <b>0.125</b> | 0.024 |
| Australia                       | 0.823            | 0.979         | 0.937        | <b>0.163</b> | 0.029 |
| Austria                         | 0.812            | 0.987         | 0.961        | <b>0.112</b> | 0.022 |
| Azerbaijan                      | 0.927            | 1.000         | 0.999        | 0.037        | 0.004 |
| Bahrain                         | 0.927            | 0.999         | 0.996        | 0.078        | 0.007 |
| Belgium                         | 0.764            | 0.963         | <b>0.889</b> | <b>0.176</b> | 0.043 |
| Flemish Community (Belgium)     | 0.732            | 0.950         | <b>0.851</b> | <b>0.184</b> | 0.047 |
| French Community (Belgium)      | 0.804            | 0.978         | 0.933        | <b>0.161</b> | 0.034 |
| Brazil                          | 0.923            | 0.996         | 0.988        | <b>0.120</b> | 0.013 |
| Bulgaria                        | 0.910            | 0.996         | 0.989        | <b>0.105</b> | 0.013 |
| Chile                           | 0.849            | 0.993         | 0.980        | 0.086        | 0.018 |
| Colombia                        | 0.870            | 0.996         | 0.988        | 0.068        | 0.012 |
| Costa Rica                      | 0.892            | 0.993         | 0.979        | <b>0.112</b> | 0.017 |
| Croatia                         | 0.871            | 0.988         | 0.965        | <b>0.137</b> | 0.020 |
| Cyprus                          | 0.890            | 0.993         | 0.978        | <b>0.134</b> | 0.019 |
| Czechia                         | 0.845            | 0.992         | 0.976        | <b>0.113</b> | 0.019 |
| Denmark                         | 0.795            | 0.974         | 0.921        | <b>0.171</b> | 0.037 |
| Estonia                         | 0.784            | 0.987         | 0.960        | <b>0.101</b> | 0.020 |
| Finland                         | 0.819            | 0.975         | 0.926        | <b>0.159</b> | 0.031 |
| France                          | 0.819            | 0.983         | 0.950        | <b>0.145</b> | 0.027 |
| Hungary                         | 0.824            | 0.982         | 0.946        | <b>0.145</b> | 0.028 |
| Iceland                         | 0.767            | 0.990         | 0.969        | 0.086        | 0.016 |
| Israel                          | 0.868            | 0.994         | 0.983        | 0.088        | 0.016 |
| Italy                           | 0.838            | 0.984         | 0.953        | <b>0.145</b> | 0.025 |
| Japan                           | 0.883            | 0.995         | 0.984        | <b>0.106</b> | 0.015 |
| Kazakhstan                      | 0.926            | 0.999         | 0.997        | 0.051        | 0.006 |
| Korea                           | 0.918            | 0.998         | 0.993        | 0.093        | 0.009 |
| Kosovo                          | 0.938            | 0.997         | 0.991        | <b>0.130</b> | 0.012 |
| Latvia                          | 0.852            | 0.992         | 0.977        | 0.099        | 0.017 |
| Lithuania                       | 0.863            | 0.989         | 0.966        | <b>0.128</b> | 0.022 |
| Malta                           | 0.835            | 0.968         | 0.905        | <b>0.235</b> | 0.039 |
| Montenegro                      | 0.931            | 0.998         | 0.993        | <b>0.120</b> | 0.011 |
| Morocco                         | 0.901            | 0.998         | 0.994        | 0.048        | 0.007 |
| Netherlands                     | 0.741            | 0.964         | <b>0.893</b> | <b>0.126</b> | 0.036 |
| New Zealand                     | 0.831            | 0.969         | 0.908        | <b>0.195</b> | 0.037 |
| North Macedonia                 | 0.922            | 0.999         | 0.997        | 0.061        | 0.006 |
| Norway                          | 0.767            | 0.989         | 0.968        | 0.077        | 0.017 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Poland                          | 0.871                           | 0.992         | 0.975        | 0.097        | 0.018 |
| Portugal                        | 0.835                           | 0.994         | 0.982        | 0.086        | 0.015 |
| Romania                         | 0.900                           | 0.990         | 0.969        | <b>0.161</b> | 0.021 |
| Saudi Arabia                    | 0.948                           | 0.999         | 0.997        | 0.085        | 0.006 |
| Serbia                          | 0.911                           | 0.999         | 0.997        | 0.062        | 0.007 |
| Shanghai (China)                | 0.909                           | 0.992         | 0.976        | <b>0.155</b> | 0.018 |
| Singapore                       | 0.836                           | 0.992         | 0.977        | 0.081        | 0.019 |
| Slovak Republic                 | 0.902                           | 0.995         | 0.986        | <b>0.114</b> | 0.013 |
| Slovenia                        | 0.877                           | 0.993         | 0.980        | <b>0.119</b> | 0.018 |
| South Africa                    | 0.920                           | 0.996         | 0.989        | <b>0.104</b> | 0.011 |
| Spain                           | 0.859                           | 0.984         | 0.952        | <b>0.140</b> | 0.027 |
| Sweden                          | 0.833                           | 0.979         | 0.937        | <b>0.150</b> | 0.028 |
| Türkiye                         | 0.914                           | 0.997         | 0.990        | <b>0.102</b> | 0.013 |
| United Arab Emirates            | 0.933                           | 0.998         | 0.994        | 0.060        | 0.018 |
| United States                   | 0.877                           | 0.979         | 0.936        | <b>0.128</b> | 0.027 |
| Uzbekistan                      | 0.897                           | 1.000         | 0.999        | 0.019        | 0.004 |
| Viet Nam                        | 0.921                           | 1.000         | 0.999        | 0.035        | 0.004 |
| International pooled data       | 0.893                           | 0.995         | 0.986        | 0.100        | 0.014 |
| <b>ISCED level 1</b>            |                                 |               |              |              |       |
| Australia                       | 0.866                           | 0.974         | 0.923        | <b>0.230</b> | 0.036 |
| Belgium                         | 0.769                           | 0.982         | 0.945        | <b>0.130</b> | 0.027 |
| Flemish Community (Belgium)     | 0.750                           | 0.988         | 0.963        | <b>0.106</b> | 0.022 |
| French Community (Belgium)      | 0.791                           | 0.970         | 0.910        | <b>0.170</b> | 0.035 |
| Brazil                          | 0.919                           | 0.996         | 0.987        | <b>0.116</b> | 0.013 |
| France                          | 0.760                           | 0.935         | <b>0.804</b> | <b>0.217</b> | 0.054 |
| Japan                           | 0.887                           | 0.988         | 0.965        | <b>0.153</b> | 0.024 |
| Korea                           | 0.938                           | 0.998         | 0.994        | <b>0.115</b> | 0.013 |
| Morocco                         | 0.911                           | 1.000         | 1.000        | 0.015        | 0.003 |
| Netherlands                     | 0.713                           | <b>0.895</b>  | <b>0.684</b> | <b>0.230</b> | 0.054 |
| New Zealand                     | 0.850                           | 0.962         | <b>0.886</b> | <b>0.228</b> | 0.043 |
| Saudi Arabia                    | 0.956                           | 1.000         | 0.999        | 0.060        | 0.004 |
| Slovenia                        | 0.881                           | 0.983         | 0.949        | <b>0.212</b> | 0.032 |
| Spain                           | 0.856                           | 0.975         | 0.925        | <b>0.158</b> | 0.039 |
| Türkiye                         | 0.921                           | 0.994         | 0.983        | <b>0.142</b> | 0.015 |
| United Arab Emirates            | 0.929                           | 0.994         | 0.981        | <b>0.151</b> | 0.017 |
| International pooled data       | 0.886                           | 0.991         | 0.974        | <b>0.156</b> | 0.020 |
| <b>ISCED level 3</b>            |                                 |               |              |              |       |
| Croatia                         | 0.889                           | 0.995         | 0.984        | <b>0.118</b> | 0.015 |
| Denmark                         | 0.825                           | 0.991         | 0.974        | 0.095        | 0.020 |
| Flemish Community (Belgium)     | 0.796                           | 0.965         | <b>0.896</b> | <b>0.201</b> | 0.039 |
| Portugal                        | 0.831                           | 0.993         | 0.980        | 0.090        | 0.015 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.949                           | 0.999         | 0.996 | 0.093        | 0.006 |
| Slovenia                        | 0.872                           | 0.993         | 0.978 | <b>0.127</b> | 0.020 |
| Türkiye                         | 0.912                           | 0.997         | 0.991 | 0.097        | 0.011 |
| United Arab Emirates            | 0.939                           | 0.997         | 0.992 | 0.095        | 0.009 |
| International pooled data       | 0.894                           | 0.994         | 0.982 | <b>0.116</b> | 0.015 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.18. Measurement invariance results from MGCFA for scale T4PDGENP with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |       |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|-------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.994     | 0.983 | 0.114 | 0.017 | -                       | -     | -       | -      |
| Equal loadings                | 0.989     | 0.986 | 0.102 | 0.028 | -0.006                  | 0.003 | -0.012  | 0.011  |
| Equal loadings and thresholds | 0.977     | 0.988 | 0.093 | 0.085 | -0.011                  | 0.002 | -0.009  | 0.058  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.19. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PDGENP**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G24D | 0.863   | -0.989      | -0.126      | 0.864       |
| TT4G24H | 0.780   | -0.873      | -0.094      | 0.748       |
| TT4G24M | 0.884   | -0.948      | -0.040      | 0.967       |
| TT4G24J | 0.811   | -1.036      | -0.147      | 0.920       |

Source: OECD, TALIS 2024 database.

### Need for professional development for teaching for diversity (T4PDIV)

A third scale was constructed from statements of TQ 24. Teachers were asked to indicate the extent to which they currently need professional learning activities in different areas, selecting from the following response options: “No need at present”, “Low level of need”, “Moderate level of need” or “High level of need”. Responses to three of the items in this question (TT4G24K, TT4G24L, TT4G24J) were used to derive a scale reflecting teachers’ *Need for professional development for teaching for diversity* (T4PDIV). Higher values on these scales indicate a greater need for professional development. Table 11.20 provides the item names, question stem, item statements, response options and scale mid-point for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.21. The fit indices for the T4PDIV scale are not presented here as the scale was measured by just three items. As can be seen, none of the reliabilities for T4PDIV are below the cut-off criterion (0.600) in any population.

Table 11.22 presents the results from the measurement invariance testing for T4PDIV for ISCED level 2. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. In the equal loadings model, the CFI, TLI and SRMR are within the cut-off criteria. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criteria for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.23 presents the standardised item loadings and thresholds based on pooled data for scale T4PDIV. The loadings for all of the items are high. Results by participating country/territory show a low loading for item TT4G24L in Croatia (ISCED level 2) and in France (ISCED level 1).

**Table 11.20. Items and response categories used in the construction of scale T4PDIV**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                                         |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4PDSUBMP     | For each of the areas listed below, please indicate the extent to which you currently need professional learning activities<br><i>Recoded response categories for scaling: 1=No need at present; 2=Low level of need; 3=Moderate level of need; 4=High level of need</i><br>Scale mid-point: 2.5 |
| TT4G24J       | Approaches to individualised learning                                                                                                                                                                                                                                                            |
| TT4G24K       | Teaching students with special education needs                                                                                                                                                                                                                                                   |
| TT4G24L       | Teaching in a multicultural or multilingual setting                                                                                                                                                                                                                                              |

Source: OECD, TALIS 2024 database.

**Table 11.21. Reliability coefficient alpha for single countries and pooled model for scale T4PDIV**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.829                           |
| Alberta (Canada)                | 0.807                           |
| Australia                       | 0.813                           |
| Austria                         | 0.806                           |
| Azerbaijan                      | 0.759                           |
| Bahrain                         | 0.862                           |
| Belgium                         | 0.798                           |
| Flemish Community (Belgium)     | 0.798                           |
| French Community (Belgium)      | 0.807                           |
| Brazil                          | 0.801                           |
| Bulgaria                        | 0.813                           |
| Chile                           | 0.756                           |
| Colombia                        | 0.818                           |
| Costa Rica                      | 0.861                           |
| Croatia                         | 0.774                           |
| Cyprus                          | 0.879                           |
| Czechia                         | 0.802                           |
| Denmark                         | 0.748                           |
| Estonia                         | 0.835                           |
| Finland                         | 0.798                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| France                          | 0.779                           |
| Hungary                         | 0.744                           |
| Iceland                         | 0.845                           |
| Israel                          | 0.826                           |
| Italy                           | 0.818                           |
| Japan                           | 0.840                           |
| Kazakhstan                      | 0.821                           |
| Korea                           | 0.913                           |
| Kosovo                          | 0.827                           |
| Latvia                          | 0.804                           |
| Lithuania                       | 0.813                           |
| Malta                           | 0.867                           |
| Montenegro                      | 0.830                           |
| Morocco                         | 0.772                           |
| Netherlands                     | 0.756                           |
| New Zealand                     | 0.862                           |
| North Macedonia                 | 0.789                           |
| Norway                          | 0.758                           |
| Poland                          | 0.792                           |
| Portugal                        | 0.804                           |
| Romania                         | 0.832                           |
| Saudi Arabia                    | 0.859                           |
| Serbia                          | 0.822                           |
| Shanghai (China)                | 0.846                           |
| Singapore                       | 0.747                           |
| Slovak Republic                 | 0.814                           |
| Slovenia                        | 0.784                           |
| South Africa                    | 0.821                           |
| Spain                           | 0.816                           |
| Sweden                          | 0.835                           |
| Türkiye                         | 0.862                           |
| United Arab Emirates            | 0.914                           |
| United States                   | 0.830                           |
| Uzbekistan                      | 0.793                           |
| Viet Nam                        | 0.801                           |
| International pooled data       | 0.824                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.813                           |
| Belgium                         | 0.760                           |
| Flemish Community (Belgium)     | 0.771                           |
| French Community (Belgium)      | 0.762                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Brazil                          | 0.789                           |
| France                          | 0.713                           |
| Japan                           | 0.843                           |
| Korea                           | 0.915                           |
| Morocco                         | 0.725                           |
| Netherlands                     | 0.670                           |
| New Zealand                     | 0.850                           |
| Saudi Arabia                    | 0.868                           |
| Slovenia                        | 0.722                           |
| Spain                           | 0.785                           |
| Türkiye                         | 0.860                           |
| United Arab Emirates            | 0.898                           |
| International pooled data       | 0.811                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.819                           |
| Denmark                         | 0.818                           |
| Flemish Community (Belgium)     | 0.807                           |
| Portugal                        | 0.810                           |
| Saudi Arabia                    | 0.854                           |
| Slovenia                        | 0.823                           |
| Türkiye                         | 0.855                           |
| United Arab Emirates            | 0.907                           |
| International pooled data       | 0.843                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.22. Measurement invariance results from MGCFA for scale T4PDIV with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.985     | 0.977 | 0.126 | 0.025 | -0.015                  | -0.023 | 0.126   | 0.025  |
| Equal loadings and thresholds | 0.941     | 0.974 | 0.133 | 0.113 | -0.044                  | -0.003 | 0.007   | 0.088  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.23. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PDIV**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G24K | 0.877   | -1.176      | -0.381      | 0.617       |
| TT4G24L | 0.695   | -0.817      | -0.034      | 0.868       |
| TT4G24J | 0.777   | -1.036      | -0.147      | 0.920       |

Source: OECD, TALIS 2024 database.

### **Barriers to professional development: lack of support in access (T4PDBR)**

TQ-25 contained items regarding challenges to participating in professional development. Teachers were asked to indicate how strongly they agreed or disagreed with different statements regarding barriers to their participation in professional learning. For each item, teachers selected one of the following response options: “Strongly disagree”, “Disagree”, “Agree” or “Strongly agree”. Responses to three items from this question (TT4G25B, TT4G25C, TT4G25D) were used to construct a scale reflecting *Barriers to professional development: lack of support in access* (T4PDBR). Higher values on this scale indicate greater perceived barriers. Table 11.24 provides the item names, question stem, item statements and response options for the items belonging to this scale, as well as the scale mid-point.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.25. The fit indices for the T4PDBR scale are not presented here as the scale was measured by just three items. The reliabilities for T4PDBR are high (above 0.700) in approximately one-third of the ISCED level 2 participants and half of the participants in ISCED levels 1 and 3, respectively. Most of the reliabilities are acceptable, with the exception of the ISCED level 2 population in Costa Rica, Iceland, Kosovo and Norway and the ISCED level 1 population in the Flemish Community of Belgium, where the reliabilities are below the cut-off criterion.

Table 11.26 presents the results from the measurement invariance testing for T4PDBR for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all four model fit indices. The equal loadings and thresholds model also exceeds the cut-off for acceptable model fit for the CFI, RMSEA and SRMR while the TLI is within the acceptable range. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.27 presents the standardised item loadings and thresholds based on pooled data for scale T4PDBR. Item TT4G25D shows an acceptable loading and the loadings for both other items are high. Results by participating country/territory show a low loading for item TT4G25D in Finland (ISCED level 2), Singapore (ISCED level 2) and Denmark (ISCED level 3); a low loading for item TT4G25B in Costa Rica (ISCED level 2), the Slovak Republic (ISCED level 2) and Kosovo (ISCED level 2); and a low loading for item TT4G25C in New Zealand (ISCED level 1).

**Table 11.24. Items and response categories used in the construction of scale T4PDBR**

| Scale or item | Question or item wording                                                                                                  |
|---------------|---------------------------------------------------------------------------------------------------------------------------|
| T4PDBR        | How strongly do you agree or disagree that the following present barriers to your participation in professional learning? |
|               | Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree                       |
|               | Scale mid-point: 2.5                                                                                                      |
| TT4G25B       | Professional learning is too expensive.                                                                                   |
| TT4G25C       | There is a lack of employer support.                                                                                      |
| TT4G25D       | Professional learning conflicts with my work schedule.                                                                    |

Source: OECD, TALIS 2024 database.



Table 11.25. Reliability coefficient alpha for single countries and pooled model for scale T4PDBR

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.656                           |
| Alberta (Canada)                | 0.715                           |
| Australia                       | 0.698                           |
| Austria                         | 0.686                           |
| Azerbaijan                      | 0.677                           |
| Bahrain                         | 0.732                           |
| Belgium                         | 0.641                           |
| Flemish Community (Belgium)     | 0.632                           |
| French Community (Belgium)      | 0.659                           |
| Brazil                          | 0.689                           |
| Bulgaria                        | 0.634                           |
| Chile                           | 0.601                           |
| Colombia                        | 0.686                           |
| Costa Rica                      | <b>0.592</b>                    |
| Croatia                         | 0.671                           |
| Cyprus                          | 0.714                           |
| Czechia                         | 0.674                           |
| Denmark                         | 0.726                           |
| Estonia                         | 0.671                           |
| Finland                         | 0.669                           |
| France                          | 0.680                           |
| Hungary                         | 0.724                           |
| Iceland                         | <b>0.572</b>                    |
| Israel                          | 0.785                           |
| Italy                           | 0.667                           |
| Japan                           | 0.769                           |
| Kazakhstan                      | 0.749                           |
| Korea                           | 0.741                           |
| Kosovo                          | <b>0.533</b>                    |
| Latvia                          | 0.699                           |
| Lithuania                       | 0.679                           |
| Malta                           | 0.636                           |
| Montenegro                      | 0.780                           |
| Morocco                         | 0.675                           |
| Netherlands                     | 0.695                           |
| New Zealand                     | 0.661                           |
| North Macedonia                 | 0.642                           |
| Norway                          | <b>0.596</b>                    |
| Poland                          | 0.748                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Portugal                        | 0.706                           |
| Romania                         | 0.618                           |
| Saudi Arabia                    | 0.754                           |
| Serbia                          | 0.654                           |
| Shanghai (China)                | 0.843                           |
| Singapore                       | 0.649                           |
| Slovak Republic                 | 0.621                           |
| Slovenia                        | 0.675                           |
| South Africa                    | 0.664                           |
| Spain                           | 0.641                           |
| Sweden                          | 0.668                           |
| Türkiye                         | 0.701                           |
| United Arab Emirates            | 0.770                           |
| United States                   | 0.710                           |
| Uzbekistan                      | 0.715                           |
| Viet Nam                        | 0.806                           |
| International pooled data       | 0.687                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.718                           |
| Belgium                         | 0.601                           |
| Flemish Community (Belgium)     | <b>0.572</b>                    |
| French Community (Belgium)      | 0.642                           |
| Brazil                          | 0.641                           |
| France                          | 0.729                           |
| Japan                           | 0.758                           |
| Korea                           | 0.744                           |
| Morocco                         | 0.649                           |
| Netherlands                     | 0.710                           |
| New Zealand                     | 0.627                           |
| Saudi Arabia                    | 0.796                           |
| Slovenia                        | 0.684                           |
| Spain                           | 0.624                           |
| Türkiye                         | 0.733                           |
| United Arab Emirates            | 0.777                           |
| International pooled data       | 0.671                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.729                           |
| Denmark                         | 0.652                           |
| Flemish Community (Belgium)     | 0.684                           |
| Portugal                        | 0.660                           |
| Saudi Arabia                    | 0.773                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Slovenia                        | 0.683                           |
| Türkiye                         | 0.725                           |
| United Arab Emirates            | 0.808                           |
| International pooled data       | 0.731                           |

Note: Coefficients in **bold** exceed the cut-off criterion. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.26. Measurement invariance results from MGCFA for scale T4PDBR with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.980     | 0.969 | 0.083 | 0.024 | -0.020                  | -0.031 | 0.083   | 0.024  |
| Equal loadings and thresholds | 0.776     | 0.902 | 0.154 | 0.148 | -0.204                  | -0.067 | 0.071   | 0.124  |

Note: Albania, Alberta (Canada), Austria, the Flemish Community (Belgium), the French Community (Belgium), Hungary, Kazakhstan, Kosovo, Morocco, the Netherlands, New Zealand, North Macedonia, Norway, Romania, Serbia and Uzbekistan are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.27. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PDBR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G25B | 0.635   | -0.891      | 0.169       | 1.293       |
| TT4G25C | 0.735   | -0.542      | 0.606       | 1.443       |
| TT4G25D | 0.595   | -1.079      | -0.044      | 1.083       |

Source: OECD, TALIS 2024 database.

### Exchange of information and ideas among teachers (T4EXINF)

The degree of *Exchange of information and ideas among teachers* (T4EXINF) was measured by three items (TT4G26D, TT4G26E, TT4G26F) from TQ-26. The item information is presented in Table 11.28. In this question, teachers were asked to indicate the frequency in which they did different activities. For each activity, teachers could select from the following response options: “Never”, “Once a year or less”, “2-4 times a year”, “5-10 times a year”, “1-3 times a month” or “Once a week or more”. Higher values on this scale indicate more frequent exchange of information and ideas.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.29. The fit indices for the T4EXINF scale are not presented here as the scale was measured by just three items. The reliabilities for T4EXINF are generally high (above 0.700) across populations.

Table 11.30 presents the results from the measurement invariance testing for T4EXINF for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all four model fit indices. The equal loadings and thresholds model also exceeds the cut-off for acceptable model fit for the CFI, RMSEA and SRMR while the TLI is within the

acceptable range. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.31 presents the standardised item loadings and thresholds based on pooled data for scale T4EXINF. The loadings for all of the items are high. Results by participating country/territory show a low item loading for item TT4G26D in the ISCED level 2 population in Belgium and the Netherlands.

**Table 11.28. Items and response categories used in the construction of scale T4EXINF**

| Scale or item | Question or item wording                                                                                                                                                                                                                                     |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4EXINF       | On average, how often do you do the following in this school?<br><i>Recoded response categories for scaling: 1=Never; 2=Once a year or less; 3=2-4 times a year; 4=5-10 times a year; 5=1-3 times a month; 6=Once a week or more</i><br>Scale mid-point: 3.5 |
| TT4G26D       | Exchange teaching materials with colleagues                                                                                                                                                                                                                  |
| TT4G26E       | Engage in discussions about the learning development of specific students                                                                                                                                                                                    |
| TT4G26F       | Work with other teachers in this school to ensure common standards in evaluations for assessing student progress                                                                                                                                             |

Source: OECD, TALIS 2024 database.

**Table 11.29. Reliability coefficient alpha for single countries and pooled model for scale T4EXINF**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.782                           |
| Alberta (Canada)                | 0.802                           |
| Australia                       | 0.771                           |
| Austria                         | 0.792                           |
| Azerbaijan                      | 0.739                           |
| Bahrain                         | 0.835                           |
| Belgium                         | 0.640                           |
| Flemish Community (Belgium)     | 0.683                           |
| French Community (Belgium)      | 0.751                           |
| Brazil                          | 0.807                           |
| Bulgaria                        | 0.776                           |
| Chile                           | 0.815                           |
| Colombia                        | 0.796                           |
| Costa Rica                      | 0.750                           |
| Croatia                         | 0.779                           |
| Cyprus                          | 0.823                           |
| Czechia                         | 0.797                           |
| Denmark                         | 0.748                           |
| Estonia                         | 0.687                           |
| Finland                         | 0.744                           |
| France                          | 0.717                           |
| Hungary                         | 0.672                           |
| Iceland                         | 0.769                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Israel                          | 0.859                           |
| Italy                           | 0.775                           |
| Japan                           | 0.777                           |
| Kazakhstan                      | 0.794                           |
| Korea                           | 0.791                           |
| Kosovo                          | 0.798                           |
| Latvia                          | 0.757                           |
| Lithuania                       | 0.747                           |
| Malta                           | 0.799                           |
| Montenegro                      | 0.821                           |
| Morocco                         | 0.790                           |
| Netherlands                     | 0.658                           |
| New Zealand                     | 0.792                           |
| North Macedonia                 | 0.799                           |
| Norway                          | 0.726                           |
| Poland                          | 0.773                           |
| Portugal                        | 0.814                           |
| Romania                         | 0.821                           |
| Saudi Arabia                    | 0.855                           |
| Serbia                          | 0.798                           |
| Shanghai (China)                | 0.854                           |
| Singapore                       | 0.823                           |
| Slovak Republic                 | 0.770                           |
| Slovenia                        | 0.770                           |
| South Africa                    | 0.837                           |
| Spain                           | 0.744                           |
| Sweden                          | 0.737                           |
| Türkiye                         | 0.825                           |
| United Arab Emirates            | 0.855                           |
| United States                   | 0.813                           |
| Uzbekistan                      | 0.765                           |
| Viet Nam                        | 0.748                           |
| International pooled data       | 0.783                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.814                           |
| Belgium                         | 0.684                           |
| Flemish Community (Belgium)     | 0.682                           |
| French Community (Belgium)      | 0.761                           |
| Brazil                          | 0.813                           |
| France                          | 0.770                           |
| Japan                           | 0.795                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Korea                           | 0.837                           |
| Morocco                         | 0.784                           |
| Netherlands                     | 0.726                           |
| New Zealand                     | 0.789                           |
| Saudi Arabia                    | 0.857                           |
| Slovenia                        | 0.762                           |
| Spain                           | 0.778                           |
| Türkiye                         | 0.838                           |
| United Arab Emirates            | 0.841                           |
| International pooled data       | 0.802                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.780                           |
| Denmark                         | 0.709                           |
| Flemish Community (Belgium)     | 0.667                           |
| Portugal                        | 0.813                           |
| Saudi Arabia                    | 0.848                           |
| Slovenia                        | 0.763                           |
| Türkiye                         | 0.823                           |
| United Arab Emirates            | 0.832                           |
| International pooled data       | 0.788                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.30. Measurement invariance results from MGCFA for scale T4EXINF with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.993     | 0.989 | 0.075 | 0.013 | -0.007                  | -0.011 | 0.075   | 0.013  |
| Equal loadings and thresholds | 0.835     | 0.961 | 0.139 | 0.133 | -0.158                  | -0.028 | 0.064   | 0.120  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.31. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4EXINF**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G26D | 0.654   | -1.422      | -0.918      | -0.347      |
| TT4G26E | 0.760   | -1.726      | -1.235      | -0.616      |
| TT4G26F | 0.818   | -1.446      | -0.915      | -0.278      |

Source: OECD, TALIS 2024 database.

### Professional collaboration in lessons among teachers (T4COLES)

The degree of *Professional collaboration in lessons among teachers* (T4COLES) was measured by four items (TT4G26A, TT4G26B, TT4G26C, TT4G26G), also from TQ-26. In this question, teachers were asked to indicate the frequency in which they carried out different activities. For each activity, teachers could select from the following response options: “Never”, “Once a year or less”, “2-4 times a year”, “5-10 times a year”, “1-3 times a month” or “Once a week or more”. Higher values on this scale indicate more frequent professional collaboration among teachers. Table 11.32 provides the item names, question stem, item statements and response options for the items belonging to this scale, as well as the scale mid-point.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.33. The reliabilities for T4COLES are generally acceptable (above 0.600) in all populations, except for the ISCED level 2 population in Austria, the French Community of Belgium and the Netherlands and the ISCED level 1 population in New Zealand. In terms of model fit, CFI and SRMR do not exceed the cut-off criteria in any of the participants. The TLI is acceptable for most participants, except for the ISCED level 2 population in Bulgaria, Denmark, France, Shanghai (People’s Republic of China, hereafter “China”) and Spain, the ISCED level 1 population in France, and the ISCED level 3 population in Denmark. The RMSEA exceeds the cut-off criterion in Cyprus, Montenegro, Saudi Arabia Shanghai (China) and Spain for ISCED level 2, in Saudi Arabia also for ISCED level 1 and in the ISCED level 3 population in Croatia and Denmark. The SRMR is within the cut-off criterion in all participants.

Table 11.34 presents the results from the measurement invariance testing for T4COLES for the ISCED level 2 population. The baseline model shows an acceptable model fit. The difference between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA and SRMR. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all indices. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.35 presents the standardised item loadings and thresholds based on pooled data for the scale T4COLES. Items TT4G26A and TT4G26G show acceptable loadings and the loadings for both other items are high. Results by participating country/territory show a low item loading for item TT4G26G in the ISCED level 2 population in Albania, Alberta (Canada), Australia, Austria, Belgium, Denmark, the French Community of Belgium, Malta, the Netherlands, New Zealand, Norway, Serbia, Singapore, Sweden and the United States; and in the ISCED level 1 population in the French Community of Belgium, the Netherlands, New Zealand and Spain. Additionally, item TT4G26A has a low loading in Kazakhstan and Uzbekistan (ISCED level 2), and item TT4G26B in the Netherlands (ISCED levels 1 and 2) and in New Zealand (ISCED level 1).

**Table 11.32. Items and response categories used in the construction of scale T4COLES**

| Scale or item | Question or item wording                                                                                                                                                                                                                                     |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4COLES       | On average, how often do you do the following in this school?<br><i>Recoded response categories for scaling: 1=Never; 2=Once a year or less; 3=2-4 times a year; 4=5-10 times a year; 5=1-3 times a month; 6=Once a week or more</i><br>Scale mid-point: 3.5 |
| TT4G26A       | Teach jointly as a team in the same class                                                                                                                                                                                                                    |
| TT4G26B       | Observe other teachers’ classes and provide feedback                                                                                                                                                                                                         |
| TT4G26C       | Engage in joint activities across different classes and age groups (e.g. projects)                                                                                                                                                                           |
| TT4G26G       | Take part in collaborative professional learning                                                                                                                                                                                                             |

Source: OECD, TALIS 2024 database.



**Table 11.33. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4COLES**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |              |              |       |
| Albania                         | 0.628            | 0.981         | 0.942        | 0.071        | 0.016 |
| Alberta (Canada)                | 0.669            | 0.994         | 0.983        | 0.029        | 0.012 |
| Australia                       | 0.655            | 0.995         | 0.984        | 0.043        | 0.010 |
| Austria                         | <b>0.573</b>     | 0.997         | 0.991        | 0.020        | 0.007 |
| Azerbaijan                      | 0.718            | 1.000         | 1.000        | 0.008        | 0.003 |
| Bahrain                         | 0.734            | 0.995         | 0.984        | 0.053        | 0.010 |
| Belgium                         | 0.627            | 0.973         | 0.919        | 0.060        | 0.015 |
| Flemish Community (Belgium)     | 0.666            | 0.971         | 0.913        | 0.077        | 0.017 |
| French Community (Belgium)      | <b>0.573</b>     | 0.969         | 0.906        | 0.054        | 0.018 |
| Brazil                          | 0.779            | 0.998         | 0.994        | 0.035        | 0.008 |
| Bulgaria                        | 0.659            | 0.966         | <b>0.897</b> | 0.098        | 0.021 |
| Chile                           | 0.738            | 0.982         | 0.947        | 0.061        | 0.018 |
| Colombia                        | 0.770            | 0.999         | 0.997        | 0.021        | 0.007 |
| Costa Rica                      | 0.753            | 0.998         | 0.994        | 0.025        | 0.009 |
| Croatia                         | 0.685            | 0.983         | 0.950        | 0.063        | 0.015 |
| Cyprus                          | 0.763            | 0.972         | 0.917        | <b>0.133</b> | 0.022 |
| Czechia                         | 0.704            | 0.988         | 0.964        | 0.069        | 0.014 |
| Denmark                         | 0.655            | 0.966         | <b>0.897</b> | 0.096        | 0.022 |
| Estonia                         | 0.677            | 0.991         | 0.974        | 0.052        | 0.011 |
| Finland                         | 0.732            | 0.985         | 0.955        | 0.071        | 0.017 |
| France                          | 0.645            | 0.957         | <b>0.870</b> | 0.096        | 0.025 |
| Hungary                         | 0.703            | 0.995         | 0.984        | 0.045        | 0.009 |
| Iceland                         | 0.651            | 0.994         | 0.982        | 0.036        | 0.011 |
| Israel                          | 0.659            | 0.989         | 0.968        | 0.047        | 0.011 |
| Italy                           | 0.717            | 0.985         | 0.954        | 0.079        | 0.021 |
| Japan                           | 0.689            | 0.993         | 0.978        | 0.052        | 0.012 |
| Kazakhstan                      | 0.684            | 0.999         | 0.997        | 0.017        | 0.005 |
| Korea                           | 0.690            | 0.993         | 0.978        | 0.054        | 0.011 |
| Kosovo                          | 0.766            | 0.991         | 0.972        | 0.072        | 0.013 |
| Latvia                          | 0.689            | 0.998         | 0.995        | 0.021        | 0.005 |
| Lithuania                       | 0.714            | 0.981         | 0.944        | 0.083        | 0.015 |
| Malta                           | 0.742            | 0.993         | 0.980        | 0.057        | 0.013 |
| Montenegro                      | 0.759            | 0.979         | 0.938        | <b>0.134</b> | 0.019 |
| Morocco                         | 0.832            | 0.978         | 0.935        | 0.073        | 0.021 |
| Netherlands                     | <b>0.557</b>     | 1.000         | 1.019        | 0.000        | 0.004 |
| New Zealand                     | 0.651            | 1.000         | 1.000        | 0.003        | 0.007 |
| North Macedonia                 | 0.757            | 0.992         | 0.976        | 0.069        | 0.012 |
| Norway                          | 0.624            | 1.000         | 1.007        | 0.000        | 0.005 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Poland                          | 0.709                           | 0.984         | 0.953        | 0.062        | 0.015 |
| Portugal                        | 0.665                           | 0.979         | 0.938        | 0.071        | 0.016 |
| Romania                         | 0.712                           | 0.999         | 0.997        | 0.020        | 0.005 |
| Saudi Arabia                    | 0.819                           | 0.986         | 0.959        | <b>0.125</b> | 0.017 |
| Serbia                          | 0.689                           | 0.986         | 0.957        | 0.080        | 0.015 |
| Shanghai (China)                | 0.749                           | 0.944         | <b>0.831</b> | <b>0.207</b> | 0.037 |
| Singapore                       | 0.600                           | 0.998         | 0.993        | 0.021        | 0.006 |
| Slovak Republic                 | 0.649                           | 0.999         | 0.996        | 0.018        | 0.005 |
| Slovenia                        | 0.645                           | 0.979         | 0.938        | 0.068        | 0.015 |
| South Africa                    | 0.765                           | 0.990         | 0.970        | 0.066        | 0.013 |
| Spain                           | 0.726                           | 0.950         | <b>0.849</b> | <b>0.105</b> | 0.030 |
| Sweden                          | 0.611                           | 0.999         | 0.997        | 0.013        | 0.007 |
| Türkiye                         | 0.767                           | 0.995         | 0.984        | 0.057        | 0.011 |
| United Arab Emirates            | 0.709                           | 0.993         | 0.978        | 0.044        | 0.013 |
| United States                   | 0.667                           | 1.000         | 0.999        | 0.006        | 0.007 |
| Uzbekistan                      | 0.683                           | 0.991         | 0.972        | 0.063        | 0.014 |
| Viet Nam                        | 0.670                           | 0.993         | 0.978        | 0.048        | 0.011 |
| International pooled data       | 0.693                           | 0.992         | 0.977        | 0.048        | 0.011 |
| <b>ISCED level 1</b>            |                                 |               |              |              |       |
| Australia                       | 0.677                           | 0.996         | 0.989        | 0.032        | 0.009 |
| Belgium                         | 0.624                           | 0.988         | 0.964        | 0.043        | 0.013 |
| Flemish Community (Belgium)     | 0.635                           | 0.981         | 0.942        | 0.062        | 0.017 |
| French Community (Belgium)      | 0.623                           | 0.986         | 0.959        | 0.043        | 0.015 |
| Brazil                          | 0.745                           | 0.989         | 0.968        | 0.059        | 0.016 |
| France                          | 0.627                           | 0.965         | <b>0.894</b> | 0.072        | 0.022 |
| Japan                           | 0.643                           | 0.991         | 0.974        | 0.046        | 0.011 |
| Korea                           | 0.648                           | 0.990         | 0.970        | 0.050        | 0.013 |
| Morocco                         | 0.777                           | 0.986         | 0.959        | 0.060        | 0.016 |
| Netherlands                     | <b>0.469</b>                    | 0.953         | <b>0.858</b> | 0.060        | 0.022 |
| New Zealand                     | <b>0.587</b>                    | 0.981         | 0.943        | 0.052        | 0.015 |
| Saudi Arabia                    | 0.809                           | 0.986         | 0.958        | <b>0.121</b> | 0.016 |
| Slovenia                        | 0.613                           | 0.998         | 0.994        | 0.020        | 0.006 |
| Spain                           | 0.727                           | 0.988         | 0.965        | 0.050        | 0.016 |
| Türkiye                         | 0.816                           | 0.997         | 0.992        | 0.048        | 0.008 |
| United Arab Emirates            | 0.715                           | 1.000         | 1.002        | 0.000        | 0.001 |
| International pooled data       | 0.674                           | 0.996         | 0.987        | 0.035        | 0.008 |
| <b>ISCED level 3</b>            |                                 |               |              |              |       |
| Croatia                         | 0.719                           | 0.972         | 0.915        | <b>0.108</b> | 0.022 |
| Denmark                         | 0.633                           | 0.934         | <b>0.802</b> | <b>0.118</b> | 0.026 |
| Flemish Community (Belgium)     | 0.667                           | 0.981         | 0.942        | 0.071        | 0.017 |
| Portugal                        | 0.700                           | 0.991         | 0.972        | 0.057        | 0.012 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |       |       |
|---------------------------------|---------------------------------|---------------|-------|-------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA | SRMR  |
| Saudi Arabia                    | 0.803                           | 0.992         | 0.976 | 0.086 | 0.012 |
| Slovenia                        | 0.694                           | 0.989         | 0.967 | 0.061 | 0.013 |
| Türkiye                         | 0.777                           | 0.995         | 0.984 | 0.058 | 0.010 |
| United Arab Emirates            | 0.746                           | 0.997         | 0.992 | 0.029 | 0.009 |
| International pooled data       | 0.730                           | 0.996         | 0.987 | 0.042 | 0.009 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.34. Measurement invariance results from MGCFA for scale T4COLES with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.986     | 0.959 | 0.071 | 0.014 | -                       | -      | -       | -      |
| Equal loadings                | 0.968     | 0.961 | 0.069 | 0.025 | -0.019                  | 0.002  | -0.002  | 0.012  |
| Equal loadings and thresholds | 0.032     | 0.704 | 0.190 | 0.222 | -0.935                  | -0.256 | 0.121   | 0.197  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.35. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4COLES**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G26A | 0.561   | -0.340      | 0.110       | 0.473       |
| TT4G26B | 0.683   | -0.377      | 0.186       | 0.778       |
| TT4G26C | 0.645   | -0.974      | -0.284      | 0.520       |
| TT4G26G | 0.560   | -1.174      | -0.483      | 0.209       |

Source: OECD, TALIS 2024 database.

### Self-efficacy in classroom management (T4SECLS)

Three scales relating to various aspects of teacher self-efficacy were constructed from the items in TQ-27. In this question, teachers had to indicate to what extent they could do different tasks, using the following response options: “Not at all”, “To some extent”, “Quite a bit” or “A lot” (see Table 11.36). Four items (TT4G27D, TT4G27F, TT4G27H, TT4G27I) were used to construct the scale *Self-efficacy in classroom management* (T4SECLS). Higher values on this scale indicate higher self-efficacy.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.37. The scale T4SECLS has high reliability (above 0.700) in all populations. As can be observed from Table 11.37, the CFI, TLI and SRMR for T4SECLS are all within the acceptable cut-off criteria for all populations. However, the RMSEA is greater than 0.100 in 13 ISCED level 2 participants, namely Belgium, Bulgaria, Estonia, Finland, France, the French Community of Belgium, Hungary, Korea, Saudi Arabia, Serbia, Shanghai (China), Singapore and the Slovak Republic; 5 ISCED level 1 participants:

the Flemish Community (Belgium), France, Japan, Korea and Saudi Arabia; and in the ISCED level 3 population in Saudi Arabia.

Table 11.38 presents the results from the measurement invariance testing for T4SECLS for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all indices. The degree of change between the equal loadings and the equal loadings and thresholds models is close to the cut-off criteria for the TLI and RMSEA and does not meet the cut-offs for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.39 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4SECLS. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.36. Items and response categories used in the construction of scale T4SECLS**

| Scale or item | Question or item wording                                                                                                                                                                     |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4SECLS       | In your teaching, to what extent can you do the following?<br><i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i><br>Scale mid-point: 2.5 |
| TT4G27D       | Control disruptive behaviour in the classroom                                                                                                                                                |
| TT4G27F       | Make my expectations about student behaviour clear                                                                                                                                           |
| TT4G27H       | Get students to follow classroom rules                                                                                                                                                       |
| TT4G27I       | Calm a student who is disruptive or noisy                                                                                                                                                    |

Source: OECD, TALIS 2024 database.

**Table 11.37. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4SECLS**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.839            | 0.999         | 0.996 | 0.026        | 0.009 |
| Alberta (Canada)                | 0.897            | 0.992         | 0.976 | 0.090        | 0.023 |
| Australia                       | 0.901            | 0.997         | 0.990 | 0.092        | 0.015 |
| Austria                         | 0.856            | 0.999         | 0.998 | 0.033        | 0.007 |
| Azerbaijan                      | 0.743            | 0.996         | 0.987 | 0.043        | 0.011 |
| Bahrain                         | 0.917            | 0.998         | 0.995 | 0.060        | 0.009 |
| Belgium                         | 0.910            | 0.996         | 0.988 | <b>0.115</b> | 0.017 |
| Flemish Community (Belgium)     | 0.915            | 0.999         | 0.998 | 0.048        | 0.008 |
| French Community (Belgium)      | 0.894            | 0.989         | 0.966 | <b>0.182</b> | 0.029 |
| Brazil                          | 0.872            | 0.999         | 0.997 | 0.034        | 0.010 |
| Bulgaria                        | 0.860            | 0.986         | 0.958 | <b>0.109</b> | 0.026 |
| Chile                           | 0.887            | 0.999         | 0.998 | 0.031        | 0.009 |
| Colombia                        | 0.882            | 1.000         | 1.001 | 0.000        | 0.002 |
| Costa Rica                      | 0.869            | 0.995         | 0.986 | 0.073        | 0.013 |
| Croatia                         | 0.918            | 0.998         | 0.993 | 0.086        | 0.013 |
| Cyprus                          | 0.913            | 0.998         | 0.993 | 0.078        | 0.011 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Czechia                         | 0.883                           | 0.999         | 0.998 | 0.042        | 0.007 |
| Denmark                         | 0.884                           | 0.999         | 0.996 | 0.042        | 0.009 |
| Estonia                         | 0.864                           | 0.993         | 0.978 | <b>0.104</b> | 0.017 |
| Finland                         | 0.858                           | 0.990         | 0.969 | <b>0.109</b> | 0.022 |
| France                          | 0.911                           | 0.994         | 0.983 | <b>0.128</b> | 0.018 |
| Hungary                         | 0.908                           | 0.994         | 0.982 | <b>0.102</b> | 0.020 |
| Iceland                         | 0.860                           | 0.998         | 0.995 | 0.060        | 0.013 |
| Israel                          | 0.931                           | 1.000         | 1.000 | 0.024        | 0.004 |
| Italy                           | 0.864                           | 0.998         | 0.993 | 0.066        | 0.013 |
| Japan                           | 0.903                           | 0.998         | 0.995 | 0.097        | 0.012 |
| Kazakhstan                      | 0.834                           | 0.999         | 0.996 | 0.033        | 0.007 |
| Korea                           | 0.931                           | 0.997         | 0.991 | <b>0.133</b> | 0.013 |
| Kosovo                          | 0.853                           | 0.994         | 0.982 | 0.066        | 0.016 |
| Latvia                          | 0.879                           | 0.993         | 0.980 | 0.096        | 0.019 |
| Lithuania                       | 0.915                           | 0.998         | 0.993 | 0.084        | 0.015 |
| Malta                           | 0.880                           | 0.995         | 0.986 | 0.095        | 0.015 |
| Montenegro                      | 0.915                           | 0.999         | 0.997 | 0.061        | 0.009 |
| Morocco                         | 0.803                           | 1.000         | 1.000 | 0.006        | 0.006 |
| Netherlands                     | 0.885                           | 1.000         | 1.000 | 0.000        | 0.006 |
| New Zealand                     | 0.901                           | 0.996         | 0.987 | 0.086        | 0.018 |
| North Macedonia                 | 0.906                           | 0.997         | 0.991 | 0.090        | 0.011 |
| Norway                          | 0.885                           | 0.998         | 0.994 | 0.058        | 0.012 |
| Poland                          | 0.901                           | 0.998         | 0.995 | 0.047        | 0.011 |
| Portugal                        | 0.916                           | 0.999         | 0.997 | 0.076        | 0.011 |
| Romania                         | 0.889                           | 0.998         | 0.994 | 0.057        | 0.010 |
| Saudi Arabia                    | 0.917                           | 0.995         | 0.986 | <b>0.101</b> | 0.016 |
| Serbia                          | 0.905                           | 0.996         | 0.989 | <b>0.108</b> | 0.016 |
| Shanghai (China)                | 0.936                           | 0.998         | 0.993 | <b>0.129</b> | 0.011 |
| Singapore                       | 0.911                           | 0.996         | 0.987 | <b>0.118</b> | 0.015 |
| Slovak Republic                 | 0.901                           | 0.995         | 0.986 | <b>0.103</b> | 0.015 |
| Slovenia                        | 0.885                           | 0.996         | 0.989 | 0.082        | 0.016 |
| South Africa                    | 0.905                           | 1.000         | 1.000 | 0.000        | 0.003 |
| Spain                           | 0.879                           | 1.000         | 0.999 | 0.023        | 0.005 |
| Sweden                          | 0.887                           | 1.000         | 1.000 | 0.008        | 0.004 |
| Türkiye                         | 0.916                           | 0.999         | 0.998 | 0.047        | 0.006 |
| United Arab Emirates            | 0.900                           | 1.000         | 1.000 | 0.000        | 0.003 |
| United States                   | 0.903                           | 0.997         | 0.992 | 0.050        | 0.015 |
| Uzbekistan                      | 0.826                           | 0.994         | 0.982 | 0.059        | 0.015 |
| Viet Nam                        | 0.868                           | 0.995         | 0.986 | 0.082        | 0.015 |
| International pooled data       | 0.894                           | 0.998         | 0.994 | 0.057        | 0.009 |

## ISCED level 1

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Australia                       | 0.907                           | 0.996         | 0.988 | 0.098        | 0.015 |
| Belgium                         | 0.898                           | 0.996         | 0.988 | 0.100        | 0.016 |
| Flemish Community (Belgium)     | 0.906                           | 0.999         | 0.996 | 0.059        | 0.010 |
| French Community (Belgium)      | 0.883                           | 0.991         | 0.974 | <b>0.140</b> | 0.025 |
| Brazil                          | 0.870                           | 1.000         | 0.999 | 0.018        | 0.008 |
| France                          | 0.895                           | 0.990         | 0.970 | <b>0.146</b> | 0.024 |
| Japan                           | 0.907                           | 0.997         | 0.992 | <b>0.104</b> | 0.013 |
| Korea                           | 0.924                           | 0.993         | 0.979 | <b>0.185</b> | 0.021 |
| Morocco                         | 0.800                           | 0.999         | 0.998 | 0.014        | 0.007 |
| Netherlands                     | 0.889                           | 0.997         | 0.992 | 0.052        | 0.018 |
| New Zealand                     | 0.896                           | 0.994         | 0.983 | 0.089        | 0.019 |
| Saudi Arabia                    | 0.927                           | 0.995         | 0.985 | <b>0.109</b> | 0.018 |
| Slovenia                        | 0.885                           | 0.994         | 0.983 | 0.100        | 0.017 |
| Spain                           | 0.891                           | 1.000         | 1.000 | 0.003        | 0.002 |
| Türkiye                         | 0.907                           | 1.000         | 1.000 | 0.000        | 0.002 |
| United Arab Emirates            | 0.898                           | 0.999         | 0.998 | 0.024        | 0.007 |
| International pooled data       | 0.906                           | 0.998         | 0.995 | 0.064        | 0.010 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.922                           | 0.999         | 0.997 | 0.061        | 0.009 |
| Denmark                         | 0.876                           | 1.000         | 1.000 | 0.000        | 0.004 |
| Flemish Community (Belgium)     | 0.917                           | 0.999         | 0.997 | 0.059        | 0.009 |
| Portugal                        | 0.901                           | 0.999         | 0.998 | 0.051        | 0.008 |
| Saudi Arabia                    | 0.915                           | 0.995         | 0.985 | <b>0.104</b> | 0.018 |
| Slovenia                        | 0.883                           | 0.998         | 0.995 | 0.059        | 0.010 |
| Türkiye                         | 0.901                           | 1.000         | 1.000 | 0.000        | 0.001 |
| United Arab Emirates            | 0.919                           | 0.999         | 0.996 | 0.038        | 0.009 |
| International pooled data       | 0.903                           | 0.999         | 0.997 | 0.048        | 0.007 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.38. Measurement invariance results from MGCFA for scale T4SECLS with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.997     | 0.992 | 0.074 | 0.012 | -                       | -      | -       | -      |
| Equal loadings                | 0.994     | 0.993 | 0.073 | 0.022 | -0.003                  | 0.000  | -0.001  | 0.010  |
| Equal loadings and thresholds | 0.979     | 0.989 | 0.088 | 0.126 | -0.015                  | -0.003 | 0.015   | 0.104  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), Iceland, the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.39. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4SECLS**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G27D | 0.845   | -2.454      | -1.090      | 0.172       |
| TT4G27F | 0.708   | -2.653      | -1.372      | -0.048      |
| TT4G27H | 0.877   | -2.626      | -1.264      | 0.078       |
| TT4G27I | 0.871   | -2.447      | -1.043      | 0.198       |

Source: OECD, TALIS 2024 database.

### Self-efficacy in instruction (T4SEINS)

Another scale constructed from TQ-27 is *Self-efficacy in instruction* (T4SEINS), based on four items (TT4G27C, TT4G27J, TT4G27K, TT4G27L). In this question, teachers had to indicate to what extent they could do different tasks, using the following response options: “Not at all”, “To some extent”, “Quite a bit” or “A lot” (see Table 11.40). Higher values on this scale indicate higher self-efficacy.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.41. The reliabilities for T4SEINS are above 0.700 in all populations. As can be seen in Table 11.41, the scale T4SEINS has a generally good model fit across all participating countries/territories; the CFI, TLI and SRMR are all within the cut-off criteria, while the RMSEA is slightly high in the ISCED level 2 population in Bulgaria, Finland, the French Community of Belgium, Iceland and Korea; the ISCED level 1 population in Korea and Slovenia, and in the ISCED level 3 population in the Flemish Community of Belgium.

Table 11.42 presents the results from the measurement invariance testing for T4SEINS for the ISCED level 2 population. The baseline model shows a good model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all indices. The degree of change between the equal loadings and the equal loadings and thresholds models is close to the cut-off criteria for the TLI and RMSEA and does not meet the cut-offs for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.43 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for scale T4SEINS. Loadings for all items are high for the pooled model as well as in single countries/territories.

**Table 11.40. Items and response categories used in the construction of scale T4SEINS**

| Scale or item | Question or item wording                                                                        |
|---------------|-------------------------------------------------------------------------------------------------|
| T4SEINS       | In your teaching, to what extent can you do the following?                                      |
|               | Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot |
|               | Scale mid-point: 2.5                                                                            |
| TT4G27C       | Craft good questions for students                                                               |
| TT4G27J       | Use a variety of assessment strategies                                                          |
| TT4G27K       | Provide an alternative explanation, for example when students are confused                      |
| TT4G27L       | Vary instructional strategies in my classroom                                                   |

Source: OECD, TALIS 2024 database.



**Table 11.41. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4SEINS**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.859            | 0.998         | 0.993 | 0.032        | 0.012 |
| Alberta (Canada)                | 0.841            | 0.992         | 0.977 | 0.064        | 0.021 |
| Australia                       | 0.835            | 0.996         | 0.988 | 0.064        | 0.014 |
| Austria                         | 0.750            | 0.998         | 0.995 | 0.028        | 0.008 |
| Azerbaijan                      | 0.793            | 0.997         | 0.991 | 0.046        | 0.011 |
| Bahrain                         | 0.905            | 0.999         | 0.997 | 0.042        | 0.008 |
| Belgium                         | 0.784            | 0.990         | 0.971 | 0.079        | 0.020 |
| Flemish Community (Belgium)     | 0.783            | 0.995         | 0.984 | 0.059        | 0.016 |
| French Community (Belgium)      | 0.729            | 0.969         | 0.908 | <b>0.119</b> | 0.030 |
| Brazil                          | 0.855            | 0.997         | 0.991 | 0.046        | 0.014 |
| Bulgaria                        | 0.862            | 0.988         | 0.965 | <b>0.108</b> | 0.023 |
| Chile                           | 0.857            | 1.000         | 0.999 | 0.012        | 0.006 |
| Colombia                        | 0.875            | 0.997         | 0.991 | 0.056        | 0.012 |
| Costa Rica                      | 0.875            | 0.999         | 0.996 | 0.040        | 0.008 |
| Croatia                         | 0.855            | 0.999         | 0.996 | 0.038        | 0.008 |
| Cyprus                          | 0.862            | 0.999         | 0.996 | 0.041        | 0.009 |
| Czechia                         | 0.789            | 1.000         | 0.999 | 0.015        | 0.005 |
| Denmark                         | 0.762            | 0.992         | 0.975 | 0.058        | 0.017 |
| Estonia                         | 0.819            | 1.000         | 0.999 | 0.021        | 0.006 |
| Finland                         | 0.772            | 0.979         | 0.937 | <b>0.111</b> | 0.025 |
| France                          | 0.787            | 0.995         | 0.985 | 0.060        | 0.014 |
| Hungary                         | 0.812            | 0.995         | 0.985 | 0.050        | 0.014 |
| Iceland                         | 0.820            | 0.985         | 0.955 | <b>0.128</b> | 0.026 |
| Israel                          | 0.882            | 0.995         | 0.984 | 0.089        | 0.017 |
| Italy                           | 0.833            | 0.993         | 0.980 | 0.084        | 0.019 |
| Japan                           | 0.876            | 0.998         | 0.993 | 0.069        | 0.009 |
| Kazakhstan                      | 0.876            | 0.998         | 0.994 | 0.051        | 0.010 |
| Korea                           | 0.918            | 0.997         | 0.992 | 0.100        | 0.012 |
| Kosovo                          | 0.889            | 1.000         | 1.000 | 0.010        | 0.004 |
| Latvia                          | 0.820            | 0.998         | 0.995 | 0.031        | 0.009 |
| Lithuania                       | 0.878            | 0.999         | 0.998 | 0.029        | 0.007 |
| Malta                           | 0.849            | 0.997         | 0.992 | 0.059        | 0.011 |
| Montenegro                      | 0.885            | 0.999         | 0.997 | 0.043        | 0.009 |
| Morocco                         | 0.778            | 1.000         | 1.000 | 0.000        | 0.005 |
| Netherlands                     | 0.760            | 0.991         | 0.973 | 0.059        | 0.021 |
| New Zealand                     | 0.806            | 0.999         | 0.996 | 0.029        | 0.010 |
| North Macedonia                 | 0.898            | 0.999         | 0.996 | 0.059        | 0.008 |
| Norway                          | 0.776            | 0.995         | 0.986 | 0.050        | 0.014 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Poland                          | 0.863                           | 0.999         | 0.998 | 0.026        | 0.008 |
| Portugal                        | 0.859                           | 0.999         | 0.998 | 0.027        | 0.007 |
| Romania                         | 0.890                           | 0.999         | 0.996 | 0.044        | 0.009 |
| Saudi Arabia                    | 0.935                           | 1.000         | 0.999 | 0.035        | 0.005 |
| Serbia                          | 0.861                           | 0.996         | 0.987 | 0.069        | 0.013 |
| Shanghai (China)                | 0.934                           | 1.000         | 1.000 | 0.026        | 0.003 |
| Singapore                       | 0.895                           | 0.998         | 0.994 | 0.061        | 0.013 |
| Slovak Republic                 | 0.849                           | 1.000         | 1.000 | 0.000        | 0.002 |
| Slovenia                        | 0.817                           | 0.993         | 0.979 | 0.077        | 0.017 |
| South Africa                    | 0.886                           | 1.000         | 1.000 | 0.012        | 0.005 |
| Spain                           | 0.839                           | 0.998         | 0.994 | 0.034        | 0.009 |
| Sweden                          | 0.823                           | 0.995         | 0.984 | 0.071        | 0.014 |
| Türkiye                         | 0.885                           | 0.999         | 0.997 | 0.046        | 0.007 |
| United Arab Emirates            | 0.901                           | 1.000         | 1.000 | 0.010        | 0.005 |
| United States                   | 0.869                           | 1.000         | 1.001 | 0.000        | 0.004 |
| Uzbekistan                      | 0.773                           | 0.997         | 0.990 | 0.038        | 0.012 |
| Viet Nam                        | 0.884                           | 1.000         | 1.000 | 0.016        | 0.004 |
| International pooled data       | 0.863                           | 0.999         | 0.996 | 0.039        | 0.007 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.862                           | 0.996         | 0.987 | 0.082        | 0.017 |
| Belgium                         | 0.808                           | 0.994         | 0.982 | 0.066        | 0.016 |
| Flemish Community (Belgium)     | 0.810                           | 0.993         | 0.979 | 0.071        | 0.017 |
| French Community (Belgium)      | 0.775                           | 0.995         | 0.986 | 0.055        | 0.014 |
| Brazil                          | 0.859                           | 0.999         | 0.996 | 0.027        | 0.010 |
| France                          | 0.805                           | 0.996         | 0.987 | 0.057        | 0.013 |
| Japan                           | 0.898                           | 1.000         | 0.999 | 0.031        | 0.005 |
| Korea                           | 0.917                           | 0.996         | 0.988 | <b>0.119</b> | 0.015 |
| Morocco                         | 0.826                           | 0.997         | 0.992 | 0.032        | 0.012 |
| Netherlands                     | 0.804                           | 1.000         | 1.000 | 0.000        | 0.011 |
| New Zealand                     | 0.848                           | 0.998         | 0.995 | 0.041        | 0.010 |
| Saudi Arabia                    | 0.945                           | 1.000         | 0.999 | 0.032        | 0.004 |
| Slovenia                        | 0.828                           | 0.988         | 0.963 | <b>0.110</b> | 0.020 |
| Spain                           | 0.856                           | 0.999         | 0.996 | 0.031        | 0.008 |
| Türkiye                         | 0.911                           | 0.999         | 0.996 | 0.057        | 0.008 |
| United Arab Emirates            | 0.889                           | 0.997         | 0.992 | 0.047        | 0.014 |
| International pooled data       | 0.885                           | 0.997         | 0.992 | 0.068        | 0.010 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.849                           | 0.991         | 0.973 | 0.099        | 0.020 |
| Denmark                         | 0.783                           | 0.995         | 0.984 | 0.043        | 0.013 |
| Flemish Community (Belgium)     | 0.796                           | 0.972         | 0.916 | <b>0.140</b> | 0.035 |
| Portugal                        | 0.840                           | 1.000         | 1.001 | 0.000        | 0.001 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |       |       |
|---------------------------------|---------------------------------|---------------|-------|-------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA | SRMR  |
| Saudi Arabia                    | 0.936                           | 0.999         | 0.998 | 0.045 | 0.007 |
| Slovenia                        | 0.815                           | 0.992         | 0.976 | 0.083 | 0.016 |
| Türkiye                         | 0.881                           | 0.996         | 0.987 | 0.086 | 0.014 |
| United Arab Emirates            | 0.894                           | 0.998         | 0.994 | 0.030 | 0.010 |
| International pooled data       | 0.870                           | 0.998         | 0.994 | 0.048 | 0.009 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.42. Measurement invariance results from MGCFA for scale T4SEINS with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.998     | 0.993 | 0.053 | 0.010 | -                       | -      | -       | -      |
| Equal loadings                | 0.995     | 0.993 | 0.051 | 0.019 | -0.003                  | 0.000  | -0.001  | 0.008  |
| Equal loadings and thresholds | 0.966     | 0.983 | 0.084 | 0.133 | -0.029                  | -0.011 | 0.032   | 0.114  |

Note: Alberta (Canada), Australia, the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand, Norway, Singapore and Viet Nam are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.43. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4SEINS**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G27C | 0.703   | -2.634      | -1.284      | 0.123       |
| TT4G27J | 0.792   | -2.380      | -0.977      | 0.299       |
| TT4G27K | 0.825   | -2.767      | -1.463      | -0.090      |
| TT4G27L | 0.849   | -2.564      | -1.092      | 0.204       |

Source: OECD, TALIS 2024 database.

### Self-efficacy in student engagement (T4SEENG)

The third scale constructed from four items from TQ-27 (TT4G27A, TT4G27B, TT4G27E, TT4G27G) is *Self-efficacy in student engagement* (T4SEENG). In this question, teachers had to indicate to what extent they could do different tasks, using the following response options: “Not at all”, “To some extent”, “Quite a bit” or “A lot” (see Table 11.44). Higher values on this scale indicate higher self-efficacy.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.45. The reliabilities for T4SEENG are above 0.700 in all populations. In terms of model fit, the CFI, TLI and SRMR for T4SEENG are within the acceptable cut-off criteria for all participating countries or territories. The RMSEA exceeds the cut-off criterion in 19 ISCED level 2 participants, 8 ISCED level 1 participants and 3 ISCED level 3 participants. RMSEA is particularly high, above 0.200, in the ISCED levels 1 and 2 populations in Korea.

Table 11.46 presents the results from the measurement invariance testing for T4SEENG for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all indices. The degree of change between the equal loadings and the equal loadings and thresholds models is close to the cut-off criteria for the TLI and RMSEA and exceeds the cut-offs for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.47 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4SEENG. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.44. Items and response categories used in the construction of scale T4SEENG**

| Scale or item | Question or item wording                                                                               |
|---------------|--------------------------------------------------------------------------------------------------------|
| T4SEENG       | In your teaching, to what extent can you do the following?                                             |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i> |
|               | Scale mid-point: 2.5                                                                                   |
| TT4G27A       | Get students to believe they can do well in schoolwork                                                 |
| TT4G27B       | Help students value learning                                                                           |
| TT4G27E       | Motivate students who show low interest in schoolwork                                                  |
| TT4G27G       | Help students think critically                                                                         |

Source: OECD, TALIS 2024 database.

**Table 11.45. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4SEENG**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 2                   |                  |               |       |       |       |
| Albania                         | 0.794            | 0.994         | 0.983 | 0.043 | 0.016 |
| Alberta (Canada)                | 0.882            | 0.994         | 0.983 | 0.095 | 0.021 |
| Australia                       | 0.882            | 0.997         | 0.991 | 0.089 | 0.014 |
| Austria                         | 0.790            | 0.999         | 0.996 | 0.035 | 0.010 |
| Azerbaijan                      | 0.770            | 1.000         | 0.999 | 0.012 | 0.004 |
| Bahrain                         | 0.906            | 0.997         | 0.991 | 0.074 | 0.010 |
| Belgium                         | 0.838            | 0.994         | 0.982 | 0.093 | 0.018 |
| Flemish Community (Belgium)     | 0.841            | 0.993         | 0.978 | 0.098 | 0.021 |
| French Community (Belgium)      | 0.828            | 0.996         | 0.988 | 0.088 | 0.017 |
| Brazil                          | 0.879            | 0.994         | 0.983 | 0.086 | 0.018 |
| Bulgaria                        | 0.850            | 0.987         | 0.960 | 0.115 | 0.025 |
| Chile                           | 0.863            | 0.989         | 0.968 | 0.111 | 0.028 |
| Colombia                        | 0.882            | 0.995         | 0.984 | 0.096 | 0.017 |
| Costa Rica                      | 0.885            | 0.991         | 0.973 | 0.124 | 0.021 |
| Croatia                         | 0.870            | 0.998         | 0.994 | 0.054 | 0.012 |
| Cyprus                          | 0.881            | 0.992         | 0.977 | 0.123 | 0.020 |
| Czechia                         | 0.813            | 0.996         | 0.989 | 0.066 | 0.015 |
| Denmark                         | 0.825            | 0.998         | 0.993 | 0.051 | 0.013 |
| Estonia                         | 0.845            | 0.992         | 0.975 | 0.117 | 0.023 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Finland                         | 0.822                           | 0.996         | 0.988 | 0.071        | 0.018 |
| France                          | 0.841                           | 0.999         | 0.997 | 0.045        | 0.009 |
| Hungary                         | 0.844                           | 0.997         | 0.990 | 0.057        | 0.013 |
| Iceland                         | 0.863                           | 0.990         | 0.969 | <b>0.147</b> | 0.026 |
| Israel                          | 0.891                           | 0.994         | 0.982 | <b>0.120</b> | 0.021 |
| Italy                           | 0.869                           | 1.000         | 1.000 | 0.000        | 0.003 |
| Japan                           | 0.862                           | 0.996         | 0.987 | 0.097        | 0.017 |
| Kazakhstan                      | 0.860                           | 0.991         | 0.974 | 0.094        | 0.018 |
| Korea                           | 0.895                           | 0.984         | 0.951 | <b>0.256</b> | 0.035 |
| Kosovo                          | 0.780                           | 0.986         | 0.957 | 0.083        | 0.026 |
| Latvia                          | 0.834                           | 0.997         | 0.992 | 0.045        | 0.013 |
| Lithuania                       | 0.875                           | 0.996         | 0.988 | 0.080        | 0.017 |
| Malta                           | 0.887                           | 0.995         | 0.985 | <b>0.126</b> | 0.019 |
| Montenegro                      | 0.900                           | 0.994         | 0.983 | <b>0.138</b> | 0.021 |
| Morocco                         | 0.829                           | 0.995         | 0.984 | 0.050        | 0.017 |
| Netherlands                     | 0.769                           | 0.991         | 0.974 | 0.056        | 0.021 |
| New Zealand                     | 0.882                           | 1.000         | 1.001 | 0.000        | 0.002 |
| North Macedonia                 | 0.867                           | 0.996         | 0.987 | <b>0.103</b> | 0.013 |
| Norway                          | 0.819                           | 1.000         | 1.001 | 0.000        | 0.005 |
| Poland                          | 0.875                           | 0.995         | 0.985 | 0.080        | 0.017 |
| Portugal                        | 0.893                           | 0.993         | 0.978 | <b>0.126</b> | 0.022 |
| Romania                         | 0.877                           | 0.995         | 0.984 | 0.099        | 0.016 |
| Saudi Arabia                    | 0.928                           | 0.993         | 0.980 | <b>0.132</b> | 0.017 |
| Serbia                          | 0.886                           | 0.994         | 0.983 | <b>0.116</b> | 0.019 |
| Shanghai (China)                | 0.935                           | 0.995         | 0.986 | <b>0.169</b> | 0.017 |
| Singapore                       | 0.901                           | 0.996         | 0.987 | <b>0.115</b> | 0.016 |
| Slovak Republic                 | 0.870                           | 0.993         | 0.978 | <b>0.120</b> | 0.020 |
| Slovenia                        | 0.845                           | 0.995         | 0.986 | 0.076        | 0.016 |
| South Africa                    | 0.913                           | 0.996         | 0.987 | 0.095        | 0.014 |
| Spain                           | 0.866                           | 0.994         | 0.983 | 0.084        | 0.019 |
| Sweden                          | 0.832                           | 0.994         | 0.983 | 0.077        | 0.016 |
| Türkiye                         | 0.911                           | 0.996         | 0.987 | <b>0.125</b> | 0.018 |
| United Arab Emirates            | 0.902                           | 0.996         | 0.989 | 0.056        | 0.012 |
| United States                   | 0.894                           | 0.998         | 0.994 | 0.060        | 0.012 |
| Uzbekistan                      | 0.735                           | 0.997         | 0.990 | 0.033        | 0.010 |
| Viet Nam                        | 0.891                           | 0.990         | 0.971 | <b>0.132</b> | 0.023 |
| International pooled data       | 0.881                           | 0.996         | 0.987 | 0.093        | 0.014 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.880                           | 0.989         | 0.968 | <b>0.166</b> | 0.027 |
| Belgium                         | 0.827                           | 0.983         | 0.949 | <b>0.135</b> | 0.030 |
| Flemish Community (Belgium)     | 0.829                           | 0.983         | 0.949 | <b>0.135</b> | 0.029 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| French Community (Belgium)      | 0.830                           | 0.990         | 0.970 | <b>0.135</b> | 0.032 |
| Brazil                          | 0.865                           | 0.997         | 0.991 | 0.051        | 0.016 |
| France                          | 0.839                           | 0.992         | 0.975 | <b>0.108</b> | 0.024 |
| Japan                           | 0.867                           | 0.998         | 0.993 | 0.076        | 0.014 |
| Korea                           | 0.900                           | 0.988         | 0.965 | <b>0.215</b> | 0.036 |
| Morocco                         | 0.843                           | 0.994         | 0.981 | 0.053        | 0.018 |
| Netherlands                     | 0.787                           | 0.982         | 0.947 | 0.098        | 0.033 |
| New Zealand                     | 0.903                           | 0.997         | 0.990 | 0.095        | 0.018 |
| Saudi Arabia                    | 0.938                           | 0.997         | 0.992 | 0.087        | 0.012 |
| Slovenia                        | 0.851                           | 0.988         | 0.964 | <b>0.137</b> | 0.027 |
| Spain                           | 0.875                           | 0.993         | 0.980 | 0.090        | 0.021 |
| Türkiye                         | 0.914                           | 0.995         | 0.985 | <b>0.127</b> | 0.019 |
| United Arab Emirates            | 0.898                           | 0.987         | 0.962 | 0.099        | 0.020 |
| International pooled data       | 0.898                           | 0.994         | 0.983 | <b>0.134</b> | 0.019 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.879                           | 0.997         | 0.990 | 0.084        | 0.015 |
| Denmark                         | 0.818                           | 0.999         | 0.998 | 0.028        | 0.008 |
| Flemish Community (Belgium)     | 0.834                           | 0.995         | 0.985 | 0.078        | 0.018 |
| Portugal                        | 0.880                           | 0.996         | 0.988 | <b>0.102</b> | 0.020 |
| Saudi Arabia                    | 0.933                           | 0.995         | 0.985 | <b>0.122</b> | 0.017 |
| Slovenia                        | 0.856                           | 0.995         | 0.986 | 0.090        | 0.016 |
| Türkiye                         | 0.902                           | 0.995         | 0.985 | <b>0.139</b> | 0.020 |
| United Arab Emirates            | 0.903                           | 0.993         | 0.980 | 0.076        | 0.019 |
| International pooled data       | 0.903                           | 0.996         | 0.989 | 0.100        | 0.015 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.46. Measurement invariance results from MGCFA for scale T4SEENG with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.995     | 0.985 | 0.094 | 0.017 | -                       | -      | -       | -      |
| Equal loadings                | 0.993     | 0.991 | 0.072 | 0.026 | -0.002                  | 0.006  | -0.022  | 0.009  |
| Equal loadings and thresholds | 0.971     | 0.985 | 0.092 | 0.141 | -0.022                  | -0.006 | 0.020   | 0.116  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand, Norway, Sweden and Viet Nam are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.47. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4SEENG**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G27A | 0.869   | -2.648      | -1.118      | 0.160       |
| TT4G27B | 0.922   | -2.519      | -0.967      | 0.213       |
| TT4G27E | 0.762   | -2.134      | -0.623      | 0.458       |
| TT4G27G | 0.698   | -2.309      | -0.970      | 0.308       |

Source: OECD, TALIS 2024 database.

### Self-efficacy in multicultural classrooms (T4SEMUL)

TQ-28 contained items regarding teachers' *Self-efficacy in multicultural classrooms* (T4SEMUL). Teachers were asked to indicate to what extent they could do different activities in their teaching, with the following possible response options: "Not at all", "To some extent", "Quite a bit" or "A lot" (see Table 11.48). Four items in this question (TT4G28A, TT4G28C, TT4G28D, TT4G28E) were used to create the T4SEMUL scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.49. The scale T4SEMUL has high reliability (above 0.700) in all populations. As can be observed from Table 11.49, the CFI for T4SEMUL is within the acceptable cut-off in all populations. The TLI is also within the cut-off criterion, except for the ISCED level 2 population in Azerbaijan. The RMSEA is greater than 0.100 in more than half of the ISCED level 2 participants, particularly in the ISCED level 2 population in Australia, Azerbaijan, Finland, Iceland, Malta, Saudi Arabia, Shanghai (China), Türkiye and Viet Nam; half of the ISCED level 1 population, particularly in Japan, Saudi Arabia and Türkiye; and all ISCED level 3 participants, particularly in Croatia, Saudi Arabia and Türkiye. The SRMR is within the cut-off criterion across populations.

Table 11.50 presents the results from the measurement invariance testing for T4SEMUL for the ISCED level 2 population. The baseline model shows an acceptable model fit with the exception of the RMSEA. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI and close to the cut-off criteria for the TLI and RMSEA and exceeds the cut-offs for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.51 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for scale T4SEMUL. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.48. Items and response categories used in the construction of scale T4SEMUL**

| Scale or item | Question or item wording                                                                                                                                                                     |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4SEMUL       | In your teaching, to what extent can you do the following?<br><i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i><br>Scale mid-point: 2.5 |
| TT4G28A       | Adapt my teaching to the cultural diversity of students                                                                                                                                      |
| TT4G28C       | Raise awareness for cultural differences amongst students                                                                                                                                    |
| TT4G28D       | Reduce ethnic stereotyping amongst students                                                                                                                                                  |
| TT4G28E       | Ensure that students with different cultural or ethnic backgrounds work together                                                                                                             |

Source: OECD, TALIS 2024 database.



**Table 11.49. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4SEMUL**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |              |              |       |
| Albania                         | 0.856            | 0.995         | 0.984        | 0.056        | 0.014 |
| Alberta (Canada)                | 0.882            | 0.984         | 0.952        | <b>0.135</b> | 0.022 |
| Australia                       | 0.908            | 0.993         | 0.980        | <b>0.155</b> | 0.017 |
| Austria                         | 0.863            | 0.988         | 0.964        | <b>0.140</b> | 0.020 |
| Azerbaijan                      | 0.798            | 0.966         | <b>0.897</b> | <b>0.175</b> | 0.033 |
| Bahrain                         | 0.932            | 0.998         | 0.993        | <b>0.101</b> | 0.010 |
| Belgium                         | 0.878            | 0.999         | 0.998        | 0.042        | 0.007 |
| Flemish Community (Belgium)     | 0.879            | 0.999         | 0.997        | 0.047        | 0.008 |
| French Community (Belgium)      | 0.877            | 0.999         | 0.996        | 0.059        | 0.009 |
| Brazil                          | 0.909            | 0.994         | 0.981        | 0.078        | 0.014 |
| Bulgaria                        | 0.898            | 0.992         | 0.976        | <b>0.148</b> | 0.018 |
| Chile                           | 0.918            | 1.000         | 0.999        | 0.042        | 0.007 |
| Colombia                        | 0.885            | 0.997         | 0.990        | 0.096        | 0.017 |
| Costa Rica                      | 0.910            | 0.997         | 0.991        | 0.096        | 0.011 |
| Croatia                         | 0.923            | 0.998         | 0.994        | <b>0.112</b> | 0.015 |
| Cyprus                          | 0.906            | 0.997         | 0.992        | 0.098        | 0.012 |
| Czechia                         | 0.887            | 0.993         | 0.980        | <b>0.129</b> | 0.016 |
| Denmark                         | 0.868            | 0.989         | 0.966        | <b>0.132</b> | 0.024 |
| Estonia                         | 0.857            | 0.986         | 0.958        | <b>0.147</b> | 0.026 |
| Finland                         | 0.857            | 0.984         | 0.953        | <b>0.165</b> | 0.026 |
| France                          | 0.885            | 0.997         | 0.992        | 0.084        | 0.011 |
| Hungary                         | 0.887            | 0.997         | 0.990        | 0.099        | 0.014 |
| Iceland                         | 0.868            | 0.986         | 0.957        | <b>0.169</b> | 0.028 |
| Israel                          | 0.906            | 0.999         | 0.998        | 0.046        | 0.006 |
| Italy                           | 0.862            | 0.992         | 0.976        | <b>0.102</b> | 0.021 |
| Japan                           | 0.931            | 0.998         | 0.993        | <b>0.142</b> | 0.011 |
| Kazakhstan                      | 0.854            | 0.992         | 0.977        | 0.098        | 0.016 |
| Korea                           | 0.950            | 0.999         | 0.997        | 0.099        | 0.006 |
| Kosovo                          | 0.885            | 0.995         | 0.986        | 0.085        | 0.014 |
| Latvia                          | 0.893            | 0.997         | 0.992        | 0.086        | 0.015 |
| Lithuania                       | 0.924            | 0.999         | 0.996        | 0.087        | 0.012 |
| Malta                           | 0.925            | 0.996         | 0.988        | <b>0.161</b> | 0.014 |
| Montenegro                      | 0.940            | 0.998         | 0.994        | <b>0.130</b> | 0.011 |
| Morocco                         | 0.863            | 0.987         | 0.962        | 0.096        | 0.023 |
| Netherlands                     | 0.863            | 0.986         | 0.957        | <b>0.141</b> | 0.024 |
| New Zealand                     | 0.869            | 0.998         | 0.994        | 0.057        | 0.012 |
| North Macedonia                 | 0.924            | 0.996         | 0.989        | <b>0.145</b> | 0.015 |
| Norway                          | 0.862            | 0.989         | 0.967        | <b>0.126</b> | 0.026 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Poland                          | 0.924                           | 0.995         | 0.985 | <b>0.113</b> | 0.020 |
| Portugal                        | 0.896                           | 0.998         | 0.994 | 0.074        | 0.011 |
| Romania                         | 0.905                           | 0.996         | 0.989 | <b>0.113</b> | 0.016 |
| Saudi Arabia                    | 0.911                           | 0.990         | 0.971 | <b>0.153</b> | 0.020 |
| Serbia                          | 0.923                           | 0.997         | 0.991 | <b>0.122</b> | 0.013 |
| Shanghai (China)                | 0.928                           | 0.994         | 0.982 | <b>0.228</b> | 0.021 |
| Singapore                       | 0.937                           | 0.998         | 0.994 | <b>0.103</b> | 0.010 |
| Slovak Republic                 | 0.900                           | 0.998         | 0.994 | 0.083        | 0.010 |
| Slovenia                        | 0.863                           | 0.990         | 0.970 | <b>0.147</b> | 0.024 |
| South Africa                    | 0.898                           | 0.997         | 0.990 | 0.080        | 0.014 |
| Spain                           | 0.883                           | 0.996         | 0.989 | 0.077        | 0.015 |
| Sweden                          | 0.876                           | 0.995         | 0.984 | 0.093        | 0.015 |
| Türkiye                         | 0.909                           | 0.991         | 0.972 | <b>0.174</b> | 0.019 |
| United Arab Emirates            | 0.913                           | 0.994         | 0.982 | <b>0.101</b> | 0.018 |
| United States                   | 0.913                           | 0.999         | 0.996 | 0.056        | 0.010 |
| Uzbekistan                      | 0.830                           | 0.985         | 0.956 | <b>0.123</b> | 0.024 |
| Viet Nam                        | 0.901                           | 0.990         | 0.969 | <b>0.213</b> | 0.023 |
| International pooled data       | 0.906                           | 0.995         | 0.986 | <b>0.114</b> | 0.013 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.917                           | 0.998         | 0.995 | 0.088        | 0.010 |
| Belgium                         | 0.893                           | 0.996         | 0.988 | 0.100        | 0.014 |
| Flemish Community (Belgium)     | 0.889                           | 0.994         | 0.983 | <b>0.113</b> | 0.019 |
| French Community (Belgium)      | 0.901                           | 0.997         | 0.991 | 0.099        | 0.013 |
| Brazil                          | 0.862                           | 0.992         | 0.976 | 0.076        | 0.020 |
| France                          | 0.879                           | 0.996         | 0.987 | 0.100        | 0.014 |
| Japan                           | 0.931                           | 0.996         | 0.989 | <b>0.186</b> | 0.018 |
| Korea                           | 0.939                           | 0.999         | 0.996 | <b>0.110</b> | 0.012 |
| Morocco                         | 0.876                           | 0.994         | 0.982 | 0.077        | 0.020 |
| Netherlands                     | 0.896                           | 0.992         | 0.976 | <b>0.152</b> | 0.025 |
| New Zealand                     | 0.905                           | 0.997         | 0.991 | 0.090        | 0.013 |
| Saudi Arabia                    | 0.909                           | 0.987         | 0.962 | <b>0.155</b> | 0.021 |
| Slovenia                        | 0.859                           | 0.997         | 0.990 | 0.085        | 0.014 |
| Spain                           | 0.891                           | 0.998         | 0.994 | 0.063        | 0.013 |
| Türkiye                         | 0.918                           | 0.994         | 0.982 | <b>0.151</b> | 0.017 |
| United Arab Emirates            | 0.901                           | 0.996         | 0.987 | 0.073        | 0.017 |
| International pooled data       | 0.915                           | 0.997         | 0.990 | <b>0.106</b> | 0.012 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.923                           | 0.996         | 0.989 | <b>0.153</b> | 0.016 |
| Denmark                         | 0.857                           | 0.993         | 0.980 | <b>0.106</b> | 0.017 |
| Flemish Community (Belgium)     | 0.895                           | 0.996         | 0.987 | <b>0.116</b> | 0.015 |
| Portugal                        | 0.906                           | 0.997         | 0.990 | <b>0.112</b> | 0.016 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.909                           | 0.987         | 0.961 | <b>0.173</b> | 0.023 |
| Slovenia                        | 0.868                           | 0.995         | 0.985 | <b>0.112</b> | 0.017 |
| Türkiye                         | 0.909                           | 0.992         | 0.976 | <b>0.173</b> | 0.019 |
| United Arab Emirates            | 0.915                           | 0.988         | 0.963 | <b>0.109</b> | 0.019 |
| International pooled data       | 0.910                           | 0.995         | 0.986 | <b>0.111</b> | 0.013 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.50. Measurement invariance results from MGCFA for scale T4SEMUL with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.995     | 0.986 | 0.121 | 0.016 | -                       | -      | -       | -      |
| Equal loadings                | 0.994     | 0.993 | 0.085 | 0.023 | -0.001                  | 0.007  | -0.035  | 0.007  |
| Equal loadings and thresholds | 0.982     | 0.991 | 0.098 | 0.111 | -0.012                  | -0.002 | 0.013   | 0.088  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.51. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4SEMUL**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G28A | 0.752   | -1.854      | -0.528      | 0.622       |
| TT4G28C | 0.882   | -1.892      | -0.691      | 0.429       |
| TT4G28D | 0.898   | -1.860      | -0.725      | 0.365       |
| TT4G28E | 0.859   | -1.817      | -0.775      | 0.319       |

Source: OECD, TALIS 2024 database.

### Growth mindset (T4GROMST)

TQ-30 asked teachers to express their agreement or disagreement with items related to fixed mindset. In Table 11.52, the items and response options are shown. All three items were reverse coded, to reflect *Growth mindset* instead of fixed mindset. Higher values on the scale express higher beliefs in growth mindset.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.53. The fit indices for the T4GROMST scale are not presented here as the scale was measured by just three items. The reliabilities for T4GROMST are above 0.700 in all populations.

Table 11.54 presents the results from the measurement invariance testing for T4GROMST for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. In the equal loadings model, the CFI, TLI and SRMR are within the cut-off criteria, whereas the RMSEA exceeds the cut-off. The degree of change between the equal loadings and the equal thresholds

and loadings models is within the cut-off criteria for the CFI, TLI and RMSEA for ISCED level 2. No special caution is required when comparing scale score results across countries/territories.

Table 11.55 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4GROMST. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.52. Items and response categories used in the construction of scale T4GROMST**

| Scale or item | Question or item wording                                                                                                                                                                                                                   |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4GROMST      | How strongly do you agree or disagree with the following statements about intelligence and learning?<br><i>Recoded response categories for scaling: 1=Strongly agree; 2=Agree; 3=Disagree; 4=Strongly disagree</i><br>Scale mid-point: 2.5 |
| TT4G30A       | Everyone has certain amount of intelligence                                                                                                                                                                                                |
| TT4G30B       | People's intelligence is something about them that they can't change                                                                                                                                                                       |
| TT4G30C       | Someone can learn new things but can't change their intelligence                                                                                                                                                                           |

Source: OECD, TALIS 2024 database.

**Table 11.53. Reliability coefficient alpha for single countries and pooled model for scale T4GROMST**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.890                           |
| Alberta (Canada)                | 0.930                           |
| Australia                       | 0.945                           |
| Austria                         | 0.915                           |
| Azerbaijan                      | 0.765                           |
| Bahrain                         | 0.903                           |
| Belgium                         | 0.895                           |
| Flemish Community (Belgium)     | 0.835                           |
| French Community (Belgium)      | 0.939                           |
| Brazil                          | 0.911                           |
| Bulgaria                        | 0.923                           |
| Chile                           | 0.923                           |
| Colombia                        | 0.925                           |
| Costa Rica                      | 0.922                           |
| Croatia                         | 0.920                           |
| Cyprus                          | 0.919                           |
| Czechia                         | 0.870                           |
| Denmark                         | 0.922                           |
| Estonia                         | 0.909                           |
| Finland                         | 0.940                           |
| France                          | 0.945                           |
| Hungary                         | 0.926                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Iceland                         | 0.899                           |
| Israel                          | 0.933                           |
| Italy                           | 0.930                           |
| Japan                           | 0.892                           |
| Kazakhstan                      | 0.829                           |
| Korea                           | 0.942                           |
| Kosovo                          | 0.898                           |
| Latvia                          | 0.924                           |
| Lithuania                       | 0.911                           |
| Malta                           | 0.927                           |
| Montenegro                      | 0.919                           |
| Morocco                         | 0.842                           |
| Netherlands                     | 0.905                           |
| New Zealand                     | 0.939                           |
| North Macedonia                 | 0.914                           |
| Norway                          | 0.873                           |
| Poland                          | 0.947                           |
| Portugal                        | 0.919                           |
| Romania                         | 0.922                           |
| Saudi Arabia                    | 0.903                           |
| Serbia                          | 0.917                           |
| Shanghai (China)                | 0.931                           |
| Singapore                       | 0.937                           |
| Slovak Republic                 | 0.884                           |
| Slovenia                        | 0.940                           |
| South Africa                    | 0.893                           |
| Spain                           | 0.932                           |
| Sweden                          | 0.931                           |
| Türkiye                         | 0.910                           |
| United Arab Emirates            | 0.922                           |
| United States                   | 0.923                           |
| Uzbekistan                      | 0.801                           |
| Viet Nam                        | 0.871                           |
| International pooled data       | 0.915                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.937                           |
| Belgium                         | 0.894                           |
| Flemish Community (Belgium)     | 0.858                           |
| French Community (Belgium)      | 0.919                           |
| Brazil                          | 0.911                           |
| France                          | 0.947                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Japan                           | 0.899                           |
| Korea                           | 0.942                           |
| Morocco                         | 0.872                           |
| Netherlands                     | 0.901                           |
| New Zealand                     | 0.959                           |
| Saudi Arabia                    | 0.902                           |
| Slovenia                        | 0.934                           |
| Spain                           | 0.927                           |
| Türkiye                         | 0.918                           |
| United Arab Emirates            | 0.909                           |
| International pooled data       | 0.922                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.915                           |
| Denmark                         | 0.922                           |
| Flemish Community (Belgium)     | 0.860                           |
| Portugal                        | 0.916                           |
| Saudi Arabia                    | 0.902                           |
| Slovenia                        | 0.936                           |
| Türkiye                         | 0.901                           |
| United Arab Emirates            | 0.917                           |
| International pooled data       | 0.911                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.54. Measurement invariance results from MGCFA for scale T4GROMST with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.998     | 0.996 | 0.107 | 0.011 | -0.002                  | -0.004 | 0.107   | 0.011  |
| Equal loadings and thresholds | 0.996     | 0.998 | 0.076 | 0.072 | -0.002                  | 0.002  | -0.031  | 0.061  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.55. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4GROMST**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G30A | 0.873   | -1.556      | -0.494      | 0.874       |
| TT4G30B | 0.934   | -1.691      | -0.568      | 0.840       |
| TT4G30C | 0.847   | -1.420      | -0.289      | 1.019       |

Source: OECD, TALIS 2024 database.

### Self-efficacy in special education needs (T4SESEN)

Teachers were asked to answer five statements measuring *Self-efficacy in special education needs* (T4SESEN). These were TT4G31A, TT4G31B, TT4G31C, TT4G31D and TT4G31E. All items were answered on a four-point scale, with response categories of “Not at all”, “To some extent”, “Quite a bit” and “A lot” (see Table 11.56).

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.57. The scale T4SESEN has high reliability (above 0.700) in all populations. As can be observed from Table 11.57, the CFI for T4SESEN is acceptable across all populations. The TLI is also acceptable in most participating countries or territories, except for the ISCED level 2 population in Belgium and the ISCED level 1 population in the Netherlands. The RMSEA exceeds the cut-off criterion in approximately half of each ISCED level populations, particularly in the ISCED level 2 population in Shanghai (China) and the ISCED levels 1 and 2 populations in Korea. The SRMR does not exceed the cut-off criterion in any of the populations.

Table 11.58 presents the results from the measurement invariance testing for T4SESEN for the ISCED level 2 population. The baseline model shows an acceptable model fit with the exception of the RMSEA. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for TLI and exceeds the cut-off criteria for the CFI, RMSEA and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.59 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4SESEN. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.56. Items and response categories used in the construction of scale T4SESEN**

| Scale or item | Question or item wording                                                                                                                                                                                        |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4SESEN       | In your work as a teacher, to what extent can you do the following practices?<br><i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i><br>Scale mid-point: 2.5 |
| TT4G31A       | Work jointly with other professionals and staff (e.g. aides, other teachers) to teach students with special education needs in the classroom                                                                    |
| TT4G31B       | Get parents/guardians involved in school activities of their children with special education needs                                                                                                              |
| TT4G31C       | Collaborate with other professionals (e.g. specialist teachers, speech pathologists) in designing educational plans for students with special education needs                                                   |
| TT4G31D       | Inform others who know little about laws and policies relating to the inclusion of students with special education needs                                                                                        |
| TT4G31E       | Design learning tasks to accommodate students with special education needs                                                                                                                                      |

Source: OECD, TALIS 2024 database.



**Table 11.57. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4SESEN**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |              |              |       |
| Albania                         | 0.900            | 0.988         | 0.977        | 0.089        | 0.022 |
| Alberta (Canada)                | 0.879            | 0.990         | 0.979        | 0.068        | 0.029 |
| Australia                       | 0.880            | 0.991         | 0.982        | 0.088        | 0.022 |
| Austria                         | 0.857            | 0.992         | 0.984        | 0.073        | 0.018 |
| Azerbaijan                      | 0.885            | 0.986         | 0.973        | <b>0.107</b> | 0.022 |
| Bahrain                         | 0.932            | 0.994         | 0.989        | <b>0.119</b> | 0.016 |
| Belgium                         | 0.832            | 0.939         | <b>0.878</b> | <b>0.173</b> | 0.051 |
| Flemish Community (Belgium)     | 0.847            | 0.963         | 0.926        | <b>0.141</b> | 0.043 |
| French Community (Belgium)      | 0.825            | 0.955         | 0.909        | <b>0.153</b> | 0.042 |
| Brazil                          | 0.908            | 0.989         | 0.978        | <b>0.109</b> | 0.024 |
| Bulgaria                        | 0.881            | 0.966         | 0.932        | <b>0.171</b> | 0.038 |
| Chile                           | 0.903            | 0.988         | 0.976        | 0.081        | 0.026 |
| Colombia                        | 0.920            | 0.992         | 0.984        | 0.095        | 0.019 |
| Costa Rica                      | 0.909            | 0.989         | 0.978        | <b>0.116</b> | 0.023 |
| Croatia                         | 0.873            | 0.989         | 0.977        | 0.086        | 0.022 |
| Cyprus                          | 0.904            | 0.986         | 0.971        | <b>0.132</b> | 0.025 |
| Czechia                         | 0.852            | 0.985         | 0.970        | 0.095        | 0.027 |
| Denmark                         | 0.863            | 0.987         | 0.975        | 0.088        | 0.025 |
| Estonia                         | 0.872            | 0.979         | 0.957        | <b>0.135</b> | 0.032 |
| Finland                         | 0.839            | 0.976         | 0.953        | 0.095        | 0.029 |
| France                          | 0.830            | 0.992         | 0.985        | 0.059        | 0.019 |
| Hungary                         | 0.889            | 0.970         | 0.940        | <b>0.160</b> | 0.039 |
| Iceland                         | 0.857            | 0.976         | 0.951        | <b>0.129</b> | 0.035 |
| Israel                          | 0.924            | 0.984         | 0.968        | <b>0.160</b> | 0.026 |
| Italy                           | 0.883            | 0.987         | 0.974        | <b>0.102</b> | 0.027 |
| Japan                           | 0.904            | 0.988         | 0.975        | <b>0.135</b> | 0.027 |
| Kazakhstan                      | 0.886            | 0.993         | 0.985        | 0.069        | 0.016 |
| Korea                           | 0.940            | 0.985         | 0.969        | <b>0.229</b> | 0.032 |
| Kosovo                          | 0.910            | 0.988         | 0.976        | <b>0.120</b> | 0.022 |
| Latvia                          | 0.907            | 0.993         | 0.987        | 0.081        | 0.018 |
| Lithuania                       | 0.877            | 0.986         | 0.971        | 0.093        | 0.027 |
| Malta                           | 0.867            | 0.992         | 0.984        | 0.087        | 0.022 |
| Montenegro                      | 0.914            | 0.990         | 0.980        | <b>0.136</b> | 0.022 |
| Morocco                         | 0.925            | 0.989         | 0.978        | <b>0.104</b> | 0.020 |
| Netherlands                     | 0.850            | 0.965         | 0.929        | <b>0.123</b> | 0.041 |
| New Zealand                     | 0.856            | 0.992         | 0.985        | 0.064        | 0.020 |
| North Macedonia                 | 0.931            | 0.990         | 0.980        | <b>0.143</b> | 0.021 |
| Norway                          | 0.861            | 0.982         | 0.963        | <b>0.104</b> | 0.030 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Poland                          | 0.906                           | 0.989         | 0.978 | 0.088        | 0.025 |
| Portugal                        | 0.859                           | 0.987         | 0.975 | 0.094        | 0.025 |
| Romania                         | 0.930                           | 0.992         | 0.984 | <b>0.120</b> | 0.021 |
| Saudi Arabia                    | 0.938                           | 0.990         | 0.980 | <b>0.164</b> | 0.019 |
| Serbia                          | 0.896                           | 0.982         | 0.963 | <b>0.146</b> | 0.025 |
| Shanghai (China)                | 0.962                           | 0.992         | 0.983 | <b>0.260</b> | 0.024 |
| Singapore                       | 0.921                           | 0.987         | 0.974 | <b>0.127</b> | 0.024 |
| Slovak Republic                 | 0.849                           | 0.968         | 0.936 | <b>0.134</b> | 0.036 |
| Slovenia                        | 0.835                           | 0.987         | 0.973 | 0.079        | 0.024 |
| South Africa                    | 0.928                           | 0.994         | 0.989 | 0.083        | 0.017 |
| Spain                           | 0.861                           | 0.991         | 0.982 | 0.063        | 0.019 |
| Sweden                          | 0.865                           | 0.993         | 0.986 | 0.060        | 0.015 |
| Türkiye                         | 0.927                           | 0.985         | 0.970 | <b>0.172</b> | 0.026 |
| United Arab Emirates            | 0.925                           | 0.997         | 0.994 | 0.046        | 0.015 |
| United States                   | 0.891                           | 0.993         | 0.986 | 0.055        | 0.023 |
| Uzbekistan                      | 0.877                           | 0.993         | 0.987 | 0.063        | 0.015 |
| Viet Nam                        | 0.924                           | 0.994         | 0.988 | <b>0.111</b> | 0.016 |
| International pooled data       | 0.896                           | 0.990         | 0.979 | 0.095        | 0.021 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.879                           | 0.987         | 0.974 | <b>0.103</b> | 0.029 |
| Belgium                         | 0.857                           | 0.980         | 0.959 | <b>0.113</b> | 0.032 |
| Flemish Community (Belgium)     | 0.867                           | 0.988         | 0.976 | 0.094        | 0.027 |
| French Community (Belgium)      | 0.839                           | 0.983         | 0.966 | 0.094        | 0.028 |
| Brazil                          | 0.882                           | 0.987         | 0.975 | 0.086        | 0.023 |
| France                          | 0.829                           | 0.992         | 0.984 | 0.059        | 0.022 |
| Japan                           | 0.893                           | 0.979         | 0.957 | <b>0.157</b> | 0.034 |
| Korea                           | 0.929                           | 0.977         | 0.954 | <b>0.248</b> | 0.045 |
| Morocco                         | 0.914                           | 0.988         | 0.977 | <b>0.104</b> | 0.020 |
| Netherlands                     | 0.831                           | 0.968         | 0.935 | <b>0.121</b> | 0.044 |
| New Zealand                     | 0.845                           | 0.982         | 0.964 | 0.093        | 0.036 |
| Saudi Arabia                    | 0.949                           | 0.993         | 0.986 | <b>0.152</b> | 0.016 |
| Slovenia                        | 0.843                           | 0.982         | 0.964 | 0.100        | 0.029 |
| Spain                           | 0.884                           | 0.993         | 0.986 | 0.061        | 0.019 |
| Türkiye                         | 0.939                           | 0.985         | 0.969 | <b>0.181</b> | 0.023 |
| United Arab Emirates            | 0.906                           | 0.990         | 0.980 | 0.076        | 0.022 |
| International pooled data       | 0.883                           | 0.986         | 0.973 | <b>0.106</b> | 0.026 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.903                           | 0.993         | 0.985 | 0.097        | 0.019 |
| Denmark                         | 0.884                           | 0.990         | 0.979 | 0.086        | 0.025 |
| Flemish Community (Belgium)     | 0.843                           | 0.973         | 0.945 | <b>0.126</b> | 0.035 |
| Portugal                        | 0.881                           | 0.984         | 0.968 | <b>0.130</b> | 0.027 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.955                           | 0.993         | 0.987 | <b>0.168</b> | 0.016 |
| Slovenia                        | 0.862                           | 0.988         | 0.976 | 0.090        | 0.022 |
| Türkiye                         | 0.936                           | 0.987         | 0.975 | <b>0.178</b> | 0.024 |
| United Arab Emirates            | 0.933                           | 0.996         | 0.993 | 0.061        | 0.015 |
| International pooled data       | 0.911                           | 0.992         | 0.984 | 0.097        | 0.019 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.58. Measurement invariance results from MGCFA for scale T4SESEN with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.989     | 0.978 | 0.118 | 0.024 | -                       | -      | -       | -      |
| Equal loadings                | 0.988     | 0.987 | 0.092 | 0.031 | -0.001                  | 0.008  | -0.026  | 0.007  |
| Equal loadings and thresholds | 0.950     | 0.972 | 0.133 | 0.135 | -0.038                  | -0.015 | 0.041   | 0.104  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.59. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4SESEN**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G31A | 0.768   | -1.633      | -0.520      | 0.495       |
| TT4G31B | 0.809   | -1.225      | -0.039      | 0.926       |
| TT4G31C | 0.860   | -1.275      | -0.257      | 0.696       |
| TT4G31D | 0.821   | -0.991      | 0.088       | 1.022       |
| TT4G31E | 0.773   | -1.527      | -0.344      | 0.734       |

Source: OECD, TALIS 2024 database.

### **Comfort with social and emotional aspects of teaching (T4COMSEL)**

The scale of *Comfort with social and emotional aspects of teaching* (T4COMSEL) was measured by a set of three statements (TT4G32A, TT4G32B, TT4G32C), described in Table 11.60. Teachers had to indicate their level of agreement with these statements, using the following response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale indicate a greater comfort with social and emotional aspects of teaching.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.61. The fit indices for T4COMSEL are not presented here as the scale was measured by just three items. The scale T4COMSEL has high reliability (above 0.700) in all populations.

Table 11.62 presents the results from the measurement invariance testing for T4COMSEL for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just

identified. The equal loadings model fit is within the acceptable cut-off criteria for the CFI, TLI and SRMR. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA, close to the cut-off for the CFI and exceeds the cut-off criterion for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.63 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4COMSEL. All items show high loadings. Results by participating country/territory show a low item loading for item TT4G32C in Chile and Colombia (ISCED level 2).

**Table 11.60. Items and response categories used in the construction of scale T4COMSEL**

| Scale or item | Question or item wording                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------|
| T4COMSEL      | How strongly do you agree or disagree with the following statements about your teaching?                   |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i> |
|               | Scale mid-point: 2.5                                                                                       |
| TT4G32A       | I am comfortable providing instruction on social and emotional skills to students.                         |
| TT4G32B       | Taking care of students' social and emotional needs comes naturally to me.                                 |
| TT4G32C       | <Informal lessons> in social and emotional learning are part of my regular teaching practice.              |

Source: OECD, TALIS 2024 database.

**Table 11.61. Reliability coefficient alpha for single countries and pooled model for scale T4COMSEL**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.808                           |
| Alberta (Canada)                | 0.908                           |
| Australia                       | 0.901                           |
| Austria                         | 0.847                           |
| Azerbaijan                      | 0.779                           |
| Bahrain                         | 0.889                           |
| Belgium                         | 0.886                           |
| Flemish Community (Belgium)     | 0.885                           |
| French Community (Belgium)      | 0.897                           |
| Brazil                          | 0.905                           |
| Bulgaria                        | 0.891                           |
| Chile                           | 0.736                           |
| Colombia                        | 0.738                           |
| Costa Rica                      | 0.853                           |
| Croatia                         | 0.894                           |
| Cyprus                          | 0.898                           |
| Czechia                         | 0.905                           |
| Denmark                         | 0.908                           |
| Estonia                         | 0.893                           |
| Finland                         | 0.883                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| France                          | 0.915                           |
| Hungary                         | 0.875                           |
| Iceland                         | 0.902                           |
| Israel                          | 0.934                           |
| Italy                           | 0.912                           |
| Japan                           | 0.887                           |
| Kazakhstan                      | 0.792                           |
| Korea                           | 0.945                           |
| Kosovo                          | 0.848                           |
| Latvia                          | 0.852                           |
| Lithuania                       | 0.877                           |
| Malta                           | 0.911                           |
| Montenegro                      | 0.897                           |
| Morocco                         | 0.824                           |
| Netherlands                     | 0.898                           |
| New Zealand                     | 0.886                           |
| North Macedonia                 | 0.874                           |
| Norway                          | 0.886                           |
| Poland                          | 0.899                           |
| Portugal                        | 0.906                           |
| Romania                         | 0.922                           |
| Saudi Arabia                    | 0.884                           |
| Serbia                          | 0.870                           |
| Shanghai (China)                | 0.965                           |
| Singapore                       | 0.923                           |
| Slovak Republic                 | 0.823                           |
| Slovenia                        | 0.855                           |
| South Africa                    | 0.903                           |
| Spain                           | 0.860                           |
| Sweden                          | 0.890                           |
| Türkiye                         | 0.864                           |
| United Arab Emirates            | 0.905                           |
| United States                   | 0.895                           |
| Uzbekistan                      | 0.790                           |
| Viet Nam                        | 0.856                           |
| International pooled data       | 0.877                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.925                           |
| Belgium                         | 0.892                           |
| Flemish Community (Belgium)     | 0.884                           |
| French Community (Belgium)      | 0.899                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Brazil                          | 0.886                           |
| France                          | 0.872                           |
| Japan                           | 0.846                           |
| Korea                           | 0.940                           |
| Morocco                         | 0.817                           |
| Netherlands                     | 0.916                           |
| New Zealand                     | 0.910                           |
| Saudi Arabia                    | 0.878                           |
| Slovenia                        | 0.864                           |
| Spain                           | 0.848                           |
| Türkiye                         | 0.881                           |
| United Arab Emirates            | 0.897                           |
| International pooled data       | 0.881                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.905                           |
| Denmark                         | 0.880                           |
| Flemish Community (Belgium)     | 0.897                           |
| Portugal                        | 0.904                           |
| Saudi Arabia                    | 0.897                           |
| Slovenia                        | 0.858                           |
| Türkiye                         | 0.867                           |
| United Arab Emirates            | 0.889                           |
| International pooled data       | 0.899                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.62. Measurement invariance results from MGCFA for scale T4COMSEL with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.994     | 0.991 | 0.113 | 0.019 | -0.006                  | -0.009 | 0.113   | 0.019  |
| Equal loadings and thresholds | 0.983     | 0.993 | 0.105 | 0.125 | -0.011                  | 0.001  | -0.008  | 0.106  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.63. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4COMSEL**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G32A | 0.860   | -2.144      | -1.226      | 0.466       |
| TT4G32B | 0.920   | -2.274      | -1.284      | 0.349       |
| TT4G32C | 0.734   | -1.851      | -0.870      | 0.605       |

Source: OECD, TALIS 2024 database.

### Self-efficacy in using digital resources and tools (T4SEDRT)

In TQ-33, teachers were asked to indicate to what extent they could do certain tasks involving the use of digital resources and tools. For each task, they could select one of the following response options: “Not at all”, “To some extent”, “Quite a bit” or “A lot”. Responses to five of the items in this question (TT4G33A, TT4G33B, TT4G33C, TT4G33D, TT4G33G) were used to derive a scale reflecting teachers’ *Self-efficacy in using digital resources and tools* (T4SEDRT). Higher values on this scale indicate a higher self-efficacy. Table 11.64 provides the item names, question stem, item statements and response options for the items belonging to this scale, as well as the scale mid-point.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.65. As can be observed, reliability for T4SEDRT is high for all populations. In terms of model fit, the CFI, TLI and SRMR for T4SEDRT are all within the acceptable cut-off criteria across populations. However, the RMSEA exceeded the cut-off criterion in 17 of the ISCED level 2 participants, ranging from 0.102 in Lithuania to 0.152 in Shanghai (China). The RMSEA also exceeded the cut-off in five ISCED level 1 participants (Australia, Brazil, Korea, Slovenia and Türkiye) and in three ISCED level 3 participants (the Flemish Community of Belgium, Portugal and Türkiye), with the highest values for both Türkiye populations, with 0.120 and 0.129, respectively.

Table 11.66 presents the results from the measurement invariance testing for T4SEDRT for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI, TLI and RMSEA and exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.67 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4SEDRT. All items show high loadings. Results by participating country/territory show a low loading for item TT4G33G in Brazil (ISCED level 1).

**Table 11.64. Items and response categories used in the construction of scale T4SEDRT**

| Scale or item | Question or item wording                                                                               |
|---------------|--------------------------------------------------------------------------------------------------------|
| T4SEDRT       | To what extent can you do the following tasks with <digital resources and tools>?                      |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i> |
|               | Scale mid-point: 2.5                                                                                   |
| TT4G33A       | Identify <digital resources and tools> to support the subject(s) I teach                               |
| TT4G33B       | Use <digital resources and tools> to present concepts in a different way to my students                |
| TT4G33C       | Choose <digital resources and tools> that enhance students’ learning                                   |
| TT4G33D       | Adapt the use of <digital resources and tools> to different teaching activities                        |
| TT4G33G       | Learn to use technology that is new to me                                                              |

Source: OECD, TALIS 2024 database.



**Table 11.65. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4SEDRT**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.910            | 0.999         | 0.999 | 0.034        | 0.009 |
| Alberta (Canada)                | 0.950            | 0.999         | 0.998 | 0.065        | 0.012 |
| Australia                       | 0.942            | 0.999         | 0.998 | 0.074        | 0.010 |
| Austria                         | 0.938            | 0.998         | 0.996 | 0.078        | 0.011 |
| Azerbaijan                      | 0.910            | 0.995         | 0.991 | 0.086        | 0.015 |
| Bahrain                         | 0.952            | 0.998         | 0.996 | 0.098        | 0.010 |
| Belgium                         | 0.940            | 0.998         | 0.997 | 0.079        | 0.009 |
| Flemish Community (Belgium)     | 0.932            | 0.999         | 0.997 | 0.061        | 0.009 |
| French Community (Belgium)      | 0.934            | 0.997         | 0.993 | <b>0.122</b> | 0.016 |
| Brazil                          | 0.920            | 0.997         | 0.994 | <b>0.125</b> | 0.012 |
| Bulgaria                        | 0.950            | 1.000         | 0.999 | 0.052        | 0.006 |
| Chile                           | 0.933            | 0.998         | 0.996 | 0.083        | 0.012 |
| Colombia                        | 0.929            | 0.998         | 0.996 | 0.090        | 0.010 |
| Costa Rica                      | 0.943            | 0.997         | 0.994 | <b>0.125</b> | 0.012 |
| Croatia                         | 0.952            | 0.998         | 0.996 | <b>0.114</b> | 0.013 |
| Cyprus                          | 0.949            | 0.998         | 0.996 | <b>0.128</b> | 0.010 |
| Czechia                         | 0.943            | 0.998         | 0.996 | 0.090        | 0.014 |
| Denmark                         | 0.940            | 0.998         | 0.995 | 0.086        | 0.013 |
| Estonia                         | 0.923            | 0.998         | 0.996 | 0.071        | 0.012 |
| Finland                         | 0.888            | 0.993         | 0.987 | 0.085        | 0.019 |
| France                          | 0.929            | 0.998         | 0.996 | 0.085        | 0.011 |
| Hungary                         | 0.943            | 0.999         | 0.999 | 0.049        | 0.007 |
| Iceland                         | 0.940            | 0.998         | 0.997 | <b>0.109</b> | 0.008 |
| Israel                          | 0.961            | 0.999         | 0.999 | 0.091        | 0.007 |
| Italy                           | 0.939            | 0.997         | 0.995 | <b>0.112</b> | 0.013 |
| Japan                           | 0.970            | 0.999         | 0.999 | <b>0.120</b> | 0.009 |
| Kazakhstan                      | 0.930            | 0.997         | 0.995 | 0.061        | 0.011 |
| Korea                           | 0.975            | 1.000         | 0.999 | 0.070        | 0.007 |
| Kosovo                          | 0.945            | 0.998         | 0.996 | 0.086        | 0.011 |
| Latvia                          | 0.935            | 0.997         | 0.993 | <b>0.106</b> | 0.014 |
| Lithuania                       | 0.951            | 0.998         | 0.996 | <b>0.102</b> | 0.013 |
| Malta                           | 0.935            | 0.998         | 0.996 | <b>0.113</b> | 0.012 |
| Montenegro                      | 0.956            | 0.999         | 0.998 | 0.094        | 0.010 |
| Morocco                         | 0.934            | 0.999         | 0.997 | 0.059        | 0.007 |
| Netherlands                     | 0.935            | 0.997         | 0.994 | 0.092        | 0.014 |
| New Zealand                     | 0.935            | 0.999         | 0.999 | 0.054        | 0.009 |
| North Macedonia                 | 0.955            | 0.999         | 0.998 | 0.087        | 0.007 |
| Norway                          | 0.937            | 0.994         | 0.989 | <b>0.144</b> | 0.020 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Poland                          | 0.956                           | 0.999         | 0.997 | 0.090        | 0.010 |
| Portugal                        | 0.932                           | 0.999         | 0.998 | 0.082        | 0.010 |
| Romania                         | 0.945                           | 0.998         | 0.996 | <b>0.107</b> | 0.010 |
| Saudi Arabia                    | 0.963                           | 0.999         | 0.998 | 0.071        | 0.007 |
| Serbia                          | 0.933                           | 0.999         | 0.997 | <b>0.112</b> | 0.009 |
| Shanghai (China)                | 0.973                           | 0.999         | 0.998 | <b>0.152</b> | 0.007 |
| Singapore                       | 0.946                           | 0.999         | 0.998 | 0.085        | 0.007 |
| Slovak Republic                 | 0.922                           | 0.994         | 0.989 | <b>0.118</b> | 0.014 |
| Slovenia                        | 0.916                           | 0.997         | 0.994 | <b>0.103</b> | 0.013 |
| South Africa                    | 0.931                           | 0.999         | 0.998 | 0.057        | 0.009 |
| Spain                           | 0.931                           | 0.998         | 0.996 | 0.080        | 0.010 |
| Sweden                          | 0.922                           | 0.998         | 0.996 | 0.073        | 0.014 |
| Türkiye                         | 0.956                           | 0.999         | 0.998 | 0.090        | 0.011 |
| United Arab Emirates            | 0.948                           | 0.997         | 0.994 | 0.077        | 0.008 |
| United States                   | 0.946                           | 0.999         | 0.998 | 0.066        | 0.011 |
| Uzbekistan                      | 0.892                           | 0.999         | 0.997 | 0.033        | 0.008 |
| Viet Nam                        | 0.948                           | 0.999         | 0.998 | 0.074        | 0.007 |
| International pooled data       | 0.942                           | 0.998         | 0.997 | 0.079        | 0.008 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.940                           | 0.999         | 0.998 | <b>0.104</b> | 0.012 |
| Belgium                         | 0.940                           | 0.998         | 0.997 | 0.081        | 0.009 |
| Flemish Community (Belgium)     | 0.937                           | 0.998         | 0.997 | 0.074        | 0.009 |
| French Community (Belgium)      | 0.932                           | 0.999         | 0.997 | 0.080        | 0.011 |
| Brazil                          | 0.900                           | 0.995         | 0.990 | <b>0.111</b> | 0.014 |
| France                          | 0.899                           | 0.997         | 0.995 | 0.075        | 0.013 |
| Japan                           | 0.972                           | 1.000         | 0.999 | 0.083        | 0.006 |
| Korea                           | 0.977                           | 1.000         | 0.999 | <b>0.107</b> | 0.008 |
| Morocco                         | 0.937                           | 0.999         | 0.997 | 0.064        | 0.009 |
| Netherlands                     | 0.932                           | 0.997         | 0.995 | 0.089        | 0.016 |
| New Zealand                     | 0.937                           | 0.999         | 0.998 | 0.074        | 0.009 |
| Saudi Arabia                    | 0.959                           | 0.998         | 0.997 | 0.086        | 0.007 |
| Slovenia                        | 0.911                           | 0.996         | 0.992 | <b>0.117</b> | 0.013 |
| Spain                           | 0.945                           | 0.998         | 0.997 | 0.079        | 0.010 |
| Türkiye                         | 0.962                           | 0.998         | 0.997 | <b>0.120</b> | 0.015 |
| United Arab Emirates            | 0.938                           | 0.998         | 0.997 | 0.058        | 0.008 |
| International pooled data       | 0.947                           | 0.998         | 0.996 | 0.100        | 0.008 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.948                           | 0.999         | 0.998 | 0.073        | 0.008 |
| Denmark                         | 0.925                           | 0.999         | 0.997 | 0.060        | 0.013 |
| Flemish Community (Belgium)     | 0.944                           | 0.997         | 0.995 | <b>0.106</b> | 0.013 |
| Portugal                        | 0.930                           | 0.998         | 0.996 | <b>0.106</b> | 0.010 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.960                           | 0.999         | 0.999 | 0.059        | 0.007 |
| Slovenia                        | 0.925                           | 0.998         | 0.997 | 0.083        | 0.010 |
| Türkiye                         | 0.953                           | 0.998         | 0.996 | <b>0.129</b> | 0.012 |
| United Arab Emirates            | 0.945                           | 1.000         | 0.999 | 0.030        | 0.006 |
| International pooled data       | 0.948                           | 0.999         | 0.998 | 0.082        | 0.008 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.66. Measurement invariance results from MGCFA for scale T4SEDRT with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |       |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|-------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.999     | 0.997 | 0.089 | 0.010 | -                       | -     | -       | -      |
| Equal loadings                | 0.998     | 0.997 | 0.087 | 0.026 | -0.001                  | 0.000 | -0.002  | 0.016  |
| Equal loadings and thresholds | 0.996     | 0.998 | 0.080 | 0.095 | -0.002                  | 0.000 | -0.007  | 0.070  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.67. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4SEDRT**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G33A | 0.891   | -2.093      | -0.716      | 0.461       |
| TT4G33B | 0.933   | -1.954      | -0.624      | 0.507       |
| TT4G33C | 0.955   | -1.965      | -0.634      | 0.507       |
| TT4G33D | 0.921   | -1.908      | -0.551      | 0.575       |
| TT4G33G | 0.684   | -1.937      | -0.670      | 0.429       |

Source: OECD, TALIS 2024 database.

### Beliefs in digital resources and tools (T4BLFDRT)

The scale *Beliefs in digital resources and tools* (T4BLFDRT) was measured by a set of four items from TQ-34 (TT4G34A, TT4G34B, TT4G34C, TT4G34H), as described in Table 11.68. Teachers had to indicate their level of agreement with these items, using the following response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale indicate more positive beliefs about the use of digital resources and tools.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.69. The scale T4BLFDRT has high reliability (above 0.700) in all populations. As can be observed from Table 11.69, the CFI, TLI and SRMR for T4BLFDRT are all within the acceptable cut-off criteria across all populations. However, the RMSEA exceeds the cut-off in the ISCED level 2 population in Japan, Korea, Romania and Viet Nam, as well as in the ISCED level 1 population in France and Korea.

Table 11.70 presents the results from the measurement invariance testing for T4BLFDRT for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI, close to the cut-off criteria for the CFI and RMSEA and exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.71 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4BLFDRT. All items show high loadings. Results by participating country/territory indicate low loadings for item TT4G34H in the Netherlands (ISCED level 2) and in the Flemish Community of Belgium (ISCED level 3).

**Table 11.68. Items and response categories used in the construction of scale T4BLFDRT**

| Scale or item | Question or item wording                                                                                                                           |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| T4BLFDRT      | Thinking about the use of <digital resources and tools> for student learning, how strongly do you agree or disagree with the following statements? |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i>                                         |
|               | Scale mid-point: 2.5                                                                                                                               |
| TT4G34A       | The use of <digital resources and tools> helps students develop greater interest in learning.                                                      |
| TT4G34B       | The use of <digital resources and tools> helps students develop skills to plan and monitor their work.                                             |
| TT4G34C       | The use of <digital resources and tools> helps improve students' academic performance.                                                             |
| TT4G34H       | The use of <digital resources and tools> helps students collaborate on tasks efficiently.                                                          |

Source: OECD, TALIS 2024 database.

**Table 11.69. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4BLFDRT**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 2                   |                  |               |       |       |       |
| Albania                         | 0.886            | 0.999         | 0.997 | 0.049 | 0.008 |
| Alberta (Canada)                | 0.874            | 1.000         | 1.001 | 0.000 | 0.003 |
| Australia                       | 0.867            | 1.000         | 0.999 | 0.031 | 0.007 |
| Austria                         | 0.818            | 1.000         | 0.999 | 0.018 | 0.005 |
| Azerbaijan                      | 0.865            | 1.000         | 0.999 | 0.035 | 0.006 |
| Bahrain                         | 0.917            | 0.999         | 0.998 | 0.071 | 0.008 |
| Belgium                         | 0.850            | 0.997         | 0.990 | 0.067 | 0.013 |
| Flemish Community (Belgium)     | 0.841            | 0.999         | 0.996 | 0.041 | 0.010 |
| French Community (Belgium)      | 0.848            | 1.000         | 1.001 | 0.000 | 0.002 |
| Brazil                          | 0.920            | 1.000         | 0.999 | 0.034 | 0.004 |
| Bulgaria                        | 0.892            | 1.000         | 1.000 | 0.021 | 0.004 |
| Chile                           | 0.930            | 0.999         | 0.997 | 0.063 | 0.008 |
| Colombia                        | 0.898            | 0.996         | 0.988 | 0.087 | 0.012 |
| Costa Rica                      | 0.909            | 0.999         | 0.997 | 0.061 | 0.009 |
| Croatia                         | 0.900            | 0.998         | 0.995 | 0.073 | 0.009 |
| Cyprus                          | 0.893            | 1.000         | 0.999 | 0.031 | 0.007 |
| Czechia                         | 0.877            | 0.999         | 0.998 | 0.038 | 0.007 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Denmark                         | 0.841                           | 0.998         | 0.995 | 0.042        | 0.011 |
| Estonia                         | 0.813                           | 0.999         | 0.996 | 0.040        | 0.009 |
| Finland                         | 0.832                           | 0.996         | 0.988 | 0.065        | 0.014 |
| France                          | 0.832                           | 1.000         | 0.999 | 0.023        | 0.005 |
| Hungary                         | 0.880                           | 0.996         | 0.989 | 0.089        | 0.015 |
| Iceland                         | 0.873                           | 1.000         | 1.000 | 0.021        | 0.006 |
| Israel                          | 0.895                           | 0.999         | 0.998 | 0.044        | 0.007 |
| Italy                           | 0.878                           | 1.000         | 1.000 | 0.016        | 0.004 |
| Japan                           | 0.880                           | 0.989         | 0.967 | <b>0.155</b> | 0.021 |
| Kazakhstan                      | 0.884                           | 0.998         | 0.993 | 0.070        | 0.013 |
| Korea                           | 0.908                           | 0.997         | 0.990 | <b>0.133</b> | 0.016 |
| Kosovo                          | 0.883                           | 0.999         | 0.997 | 0.043        | 0.008 |
| Latvia                          | 0.832                           | 1.000         | 1.000 | 0.000        | 0.004 |
| Lithuania                       | 0.896                           | 0.999         | 0.998 | 0.038        | 0.007 |
| Malta                           | 0.886                           | 0.999         | 0.998 | 0.051        | 0.008 |
| Montenegro                      | 0.916                           | 0.999         | 0.998 | 0.078        | 0.009 |
| Morocco                         | 0.902                           | 1.000         | 1.000 | 0.015        | 0.004 |
| Netherlands                     | 0.771                           | 0.988         | 0.965 | 0.095        | 0.026 |
| New Zealand                     | 0.866                           | 1.000         | 1.002 | 0.000        | 0.001 |
| North Macedonia                 | 0.918                           | 0.999         | 0.997 | 0.077        | 0.007 |
| Norway                          | 0.853                           | 0.999         | 0.997 | 0.042        | 0.008 |
| Poland                          | 0.870                           | 0.997         | 0.990 | 0.070        | 0.018 |
| Portugal                        | 0.909                           | 0.999         | 0.998 | 0.053        | 0.007 |
| Romania                         | 0.906                           | 0.997         | 0.990 | <b>0.114</b> | 0.015 |
| Saudi Arabia                    | 0.944                           | 1.000         | 1.000 | 0.032        | 0.004 |
| Serbia                          | 0.912                           | 0.999         | 0.997 | 0.073        | 0.008 |
| Shanghai (China)                | 0.948                           | 0.999         | 0.998 | 0.099        | 0.008 |
| Singapore                       | 0.866                           | 0.995         | 0.985 | 0.100        | 0.018 |
| Slovak Republic                 | 0.861                           | 0.998         | 0.993 | 0.061        | 0.011 |
| Slovenia                        | 0.855                           | 0.998         | 0.994 | 0.061        | 0.013 |
| South Africa                    | 0.907                           | 1.000         | 1.000 | 0.000        | 0.003 |
| Spain                           | 0.889                           | 1.000         | 0.999 | 0.022        | 0.004 |
| Sweden                          | 0.851                           | 1.000         | 1.001 | 0.000        | 0.003 |
| Türkiye                         | 0.906                           | 0.999         | 0.998 | 0.066        | 0.008 |
| United Arab Emirates            | 0.918                           | 0.998         | 0.993 | 0.091        | 0.012 |
| United States                   | 0.887                           | 0.998         | 0.995 | 0.066        | 0.013 |
| Uzbekistan                      | 0.888                           | 0.998         | 0.993 | 0.063        | 0.008 |
| Viet Nam                        | 0.932                           | 0.997         | 0.991 | <b>0.131</b> | 0.015 |
| International pooled data       | 0.899                           | 1.000         | 0.999 | 0.036        | 0.005 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.874                           | 0.999         | 0.997 | 0.046        | 0.010 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Belgium                         | 0.829                           | 0.997         | 0.990 | 0.059        | 0.011 |
| Flemish Community (Belgium)     | 0.830                           | 1.000         | 1.000 | 0.008        | 0.005 |
| French Community (Belgium)      | 0.810                           | 0.994         | 0.982 | 0.072        | 0.015 |
| Brazil                          | 0.897                           | 0.999         | 0.998 | 0.052        | 0.009 |
| France                          | 0.768                           | 0.975         | 0.926 | <b>0.124</b> | 0.030 |
| Japan                           | 0.871                           | 1.000         | 1.000 | 0.000        | 0.002 |
| Korea                           | 0.918                           | 0.997         | 0.991 | <b>0.117</b> | 0.013 |
| Morocco                         | 0.907                           | 0.999         | 0.998 | 0.045        | 0.008 |
| Netherlands                     | 0.815                           | 0.985         | 0.956 | <b>0.118</b> | 0.026 |
| New Zealand                     | 0.848                           | 0.999         | 0.998 | 0.026        | 0.007 |
| Saudi Arabia                    | 0.949                           | 1.000         | 0.999 | 0.064        | 0.006 |
| Slovenia                        | 0.862                           | 0.998         | 0.993 | 0.060        | 0.010 |
| Spain                           | 0.895                           | 0.999         | 0.998 | 0.033        | 0.007 |
| Türkiye                         | 0.905                           | 0.999         | 0.996 | 0.099        | 0.016 |
| United Arab Emirates            | 0.920                           | 1.000         | 0.999 | 0.031        | 0.005 |
| International pooled data       | 0.893                           | 1.000         | 0.999 | 0.023        | 0.003 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.907                           | 0.998         | 0.995 | 0.076        | 0.010 |
| Denmark                         | 0.824                           | 0.990         | 0.970 | 0.099        | 0.023 |
| Flemish Community (Belgium)     | 0.812                           | 1.000         | 1.001 | 0.000        | 0.003 |
| Portugal                        | 0.917                           | 0.999         | 0.997 | 0.065        | 0.009 |
| Saudi Arabia                    | 0.942                           | 1.000         | 1.000 | 0.049        | 0.005 |
| Slovenia                        | 0.865                           | 1.000         | 1.000 | 0.000        | 0.003 |
| Türkiye                         | 0.913                           | 1.000         | 1.000 | 0.023        | 0.004 |
| United Arab Emirates            | 0.916                           | 0.999         | 0.998 | 0.042        | 0.007 |
| International pooled data       | 0.911                           | 0.999         | 0.998 | 0.045        | 0.006 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.70. Measurement invariance results from MGCFA for scale T4BLFDRT with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.999     | 0.996 | 0.065 | 0.009 | -                       | -      | -       | -      |
| Equal loadings                | 0.997     | 0.997 | 0.062 | 0.020 | -0.002                  | 0.000  | -0.003  | 0.010  |
| Equal loadings and thresholds | 0.990     | 0.995 | 0.077 | 0.103 | -0.007                  | -0.002 | 0.015   | 0.083  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.71. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4BLFDRT**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G34A | 0.876   | -2.221      | -1.188      | 0.600       |
| TT4G34B | 0.908   | -2.068      | -0.860      | 0.792       |
| TT4G34C | 0.888   | -1.963      | -0.717      | 0.853       |
| TT4G34H | 0.678   | -2.060      | -0.812      | 1.063       |

Source: OECD, TALIS 2024 database.

### **Adversity to digital resources and tools (T4ADVDRT)**

The scale of *Adversity to digital resources and tools* (T4ADVDRT) was measured by a set of four items, TT4G34D, TT4G34E, TT4G34F and TT4G34G, described in Table 11.72. Teachers were asked to indicate their level of agreement with each item using the following response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale reflect greater agreement with statements critical of the use of digital resources and tools.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.73. The scale T4ADVDRT has high reliability (above 0.700) in all populations. As can be observed from Table 11.73, the CFI, TLI and SRMR for T4ADVDRT are all within the acceptable cut-off criteria for all populations. However, the RMSEA exceeds the cut-off in the ISCED level 2 population in Albania, Australia, Bahrain, Costa Rica, Kosovo, Montenegro, New Zealand, North Macedonia, Saudi Arabia, South Africa, Türkiye, Uzbekistan and Viet Nam; the ISCED level 1 population in Brazil, Saudi Arabia, Türkiye and the United Arab Emirates; and the ISCED level 3 population in Saudi Arabia.

Table 11.74 presents the results from the measurement invariance testing for T4ADVDRT for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA and SRMR and very close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models is close the acceptable range for the TLI and RMSEA and exceeds the cut-off criteria for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.75 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4ADVDRT. All items show high loadings. Results by participating country/territory indicate low loadings for item TT4G34G in Japan (ISCED levels 1 and 2) and Morocco (ISCED level 1).

**Table 11.72. Items and response categories used in the construction of scale T4ADVDRT**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                                 |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4ADVDRT      | Thinking about the use of <digital resources and tools> for student learning, how strongly do you agree or disagree with the following statements?<br><i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i><br>Scale mid-point: 2.5 |
| TT4G34D       | The use of <digital resources and tools> distracts students from learning.                                                                                                                                                                                                               |
| TT4G34E       | The use of <digital resources and tools> limits the amount of face-to-face communication among students.                                                                                                                                                                                 |
| TT4G34F       | Frequent use of <digital resources and tools> negatively impacts students' well-being.                                                                                                                                                                                                   |
| TT4G34G       | The use of <digital resources and tools> results in students submitting Internet content as their own work.                                                                                                                                                                              |

Source: OECD, TALIS 2024 database.



**Table 11.73. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4ADVDR**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 2                   |                  |               |       |       |       |
| Albania                         | 0.834            | 0.989         | 0.967 | 0.117 | 0.018 |
| Alberta (Canada)                | 0.835            | 0.996         | 0.987 | 0.057 | 0.015 |
| Australia                       | 0.833            | 0.990         | 0.971 | 0.108 | 0.017 |
| Austria                         | 0.824            | 0.998         | 0.995 | 0.044 | 0.009 |
| Azerbaijan                      | 0.830            | 0.997         | 0.992 | 0.055 | 0.010 |
| Bahrain                         | 0.861            | 0.990         | 0.969 | 0.166 | 0.025 |
| Belgium                         | 0.785            | 0.999         | 0.997 | 0.026 | 0.006 |
| Flemish Community (Belgium)     | 0.769            | 1.000         | 1.001 | 0.000 | 0.003 |
| French Community (Belgium)      | 0.828            | 0.999         | 0.998 | 0.027 | 0.006 |
| Brazil                          | 0.858            | 0.996         | 0.987 | 0.089 | 0.013 |
| Bulgaria                        | 0.835            | 0.999         | 0.998 | 0.034 | 0.007 |
| Chile                           | 0.850            | 0.994         | 0.982 | 0.070 | 0.014 |
| Colombia                        | 0.859            | 0.998         | 0.995 | 0.044 | 0.007 |
| Costa Rica                      | 0.857            | 0.993         | 0.978 | 0.105 | 0.017 |
| Croatia                         | 0.872            | 1.000         | 1.001 | 0.000 | 0.002 |
| Cyprus                          | 0.844            | 1.000         | 1.001 | 0.000 | 0.003 |
| Czechia                         | 0.801            | 0.993         | 0.980 | 0.075 | 0.016 |
| Denmark                         | 0.798            | 0.996         | 0.988 | 0.064 | 0.014 |
| Estonia                         | 0.814            | 1.000         | 1.000 | 0.009 | 0.004 |
| Finland                         | 0.763            | 0.997         | 0.990 | 0.047 | 0.010 |
| France                          | 0.838            | 1.000         | 1.000 | 0.011 | 0.004 |
| Hungary                         | 0.828            | 0.998         | 0.995 | 0.040 | 0.007 |
| Iceland                         | 0.780            | 0.995         | 0.985 | 0.068 | 0.015 |
| Israel                          | 0.876            | 1.000         | 0.999 | 0.027 | 0.005 |
| Italy                           | 0.830            | 1.000         | 1.000 | 0.014 | 0.004 |
| Japan                           | 0.752            | 0.999         | 0.998 | 0.027 | 0.007 |
| Kazakhstan                      | 0.829            | 0.999         | 0.997 | 0.034 | 0.007 |
| Korea                           | 0.890            | 0.999         | 0.997 | 0.051 | 0.006 |
| Kosovo                          | 0.818            | 0.979         | 0.936 | 0.149 | 0.026 |
| Latvia                          | 0.783            | 0.989         | 0.966 | 0.082 | 0.020 |
| Lithuania                       | 0.816            | 0.997         | 0.992 | 0.053 | 0.012 |
| Malta                           | 0.830            | 1.000         | 1.000 | 0.002 | 0.004 |
| Montenegro                      | 0.891            | 0.996         | 0.988 | 0.109 | 0.015 |
| Morocco                         | 0.783            | 0.992         | 0.976 | 0.064 | 0.013 |
| Netherlands                     | 0.819            | 0.993         | 0.978 | 0.083 | 0.019 |
| New Zealand                     | 0.810            | 0.985         | 0.955 | 0.123 | 0.023 |
| North Macedonia                 | 0.861            | 0.995         | 0.985 | 0.104 | 0.013 |
| Norway                          | 0.738            | 0.997         | 0.991 | 0.039 | 0.013 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Poland                          | 0.861                           | 0.999         | 0.996 | 0.036        | 0.008 |
| Portugal                        | 0.834                           | 1.000         | 0.999 | 0.021        | 0.005 |
| Romania                         | 0.853                           | 0.998         | 0.993 | 0.063        | 0.008 |
| Saudi Arabia                    | 0.853                           | 0.974         | 0.923 | <b>0.218</b> | 0.030 |
| Serbia                          | 0.868                           | 0.997         | 0.991 | 0.079        | 0.010 |
| Shanghai (China)                | 0.901                           | 0.998         | 0.995 | 0.075        | 0.007 |
| Singapore                       | 0.805                           | 0.997         | 0.992 | 0.045        | 0.009 |
| Slovak Republic                 | 0.826                           | 0.999         | 0.998 | 0.027        | 0.006 |
| Slovenia                        | 0.764                           | 0.998         | 0.994 | 0.034        | 0.010 |
| South Africa                    | 0.833                           | 0.986         | 0.958 | <b>0.118</b> | 0.024 |
| Spain                           | 0.852                           | 0.998         | 0.994 | 0.044        | 0.009 |
| Sweden                          | 0.823                           | 0.997         | 0.991 | 0.052        | 0.011 |
| Türkiye                         | 0.841                           | 0.986         | 0.958 | <b>0.131</b> | 0.020 |
| United Arab Emirates            | 0.884                           | 0.994         | 0.983 | 0.072        | 0.011 |
| United States                   | 0.819                           | 1.000         | 1.004 | 0.000        | 0.001 |
| Uzbekistan                      | 0.824                           | 0.991         | 0.973 | <b>0.110</b> | 0.018 |
| Viet Nam                        | 0.884                           | 0.991         | 0.972 | <b>0.173</b> | 0.017 |
| International pooled data       | 0.826                           | 0.998         | 0.994 | 0.043        | 0.007 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.842                           | 0.997         | 0.991 | 0.063        | 0.010 |
| Belgium                         | 0.778                           | 0.998         | 0.993 | 0.041        | 0.009 |
| Flemish Community (Belgium)     | 0.776                           | 1.000         | 1.002 | 0.000        | 0.003 |
| French Community (Belgium)      | 0.797                           | 0.999         | 0.997 | 0.029        | 0.007 |
| Brazil                          | 0.830                           | 0.985         | 0.955 | <b>0.127</b> | 0.022 |
| France                          | 0.774                           | 0.995         | 0.986 | 0.056        | 0.013 |
| Japan                           | 0.753                           | 0.996         | 0.989 | 0.057        | 0.013 |
| Korea                           | 0.896                           | 1.000         | 0.999 | 0.032        | 0.004 |
| Morocco                         | 0.747                           | 0.993         | 0.980 | 0.055        | 0.015 |
| Netherlands                     | 0.777                           | 1.000         | 0.999 | 0.016        | 0.012 |
| New Zealand                     | 0.798                           | 0.998         | 0.994 | 0.039        | 0.010 |
| Saudi Arabia                    | 0.872                           | 0.986         | 0.957 | <b>0.173</b> | 0.021 |
| Slovenia                        | 0.769                           | 0.997         | 0.990 | 0.052        | 0.012 |
| Spain                           | 0.848                           | 0.999         | 0.997 | 0.027        | 0.006 |
| Türkiye                         | 0.830                           | 0.988         | 0.963 | <b>0.111</b> | 0.017 |
| United Arab Emirates            | 0.865                           | 0.992         | 0.977 | <b>0.104</b> | 0.016 |
| International pooled data       | 0.807                           | 0.995         | 0.986 | 0.066        | 0.011 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.877                           | 0.999         | 0.998 | 0.039        | 0.006 |
| Denmark                         | 0.866                           | 0.999         | 0.998 | 0.037        | 0.007 |
| Flemish Community (Belgium)     | 0.803                           | 0.998         | 0.995 | 0.040        | 0.009 |
| Portugal                        | 0.829                           | 1.000         | 1.000 | 0.000        | 0.002 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.864                           | 0.979         | 0.937 | <b>0.205</b> | 0.031 |
| Slovenia                        | 0.782                           | 1.000         | 1.000 | 0.000        | 0.004 |
| Türkiye                         | 0.831                           | 0.994         | 0.981 | 0.089        | 0.014 |
| United Arab Emirates            | 0.873                           | 0.993         | 0.978 | 0.096        | 0.017 |
| International pooled data       | 0.841                           | 0.995         | 0.985 | 0.076        | 0.012 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) are excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.74. Measurement invariance results from MGCFA for scale T4ADVDRIT with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.995     | 0.986 | 0.080 | 0.011 | -                       | -      | -       | -      |
| Equal loadings                | 0.990     | 0.988 | 0.073 | 0.023 | -0.005                  | 0.002  | -0.006  | 0.012  |
| Equal loadings and thresholds | 0.949     | 0.974 | 0.108 | 0.116 | -0.041                  | -0.014 | 0.034   | 0.092  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.75. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4ADVDRIT**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G34D | 0.735   | -1.536      | -0.005      | 1.178       |
| TT4G34E | 0.828   | -1.728      | -0.334      | 0.969       |
| TT4G34F | 0.800   | -1.624      | -0.283      | 1.003       |
| TT4G34G | 0.610   | -2.000      | -0.677      | 0.927       |

Source: OECD, TALIS 2024 database.

### Student engagement in environmental and sustainability education (T4STESE)

Teachers answered four items measuring *Student engagement in environmental and sustainability education* (T4STESE). These items were TT4G39C, TT4G39D, TT4G39E and TT4G39G. Each item (described in Table 11.76) had four response categories: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher values on this scale reflect higher student engagement, as reported by teachers.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.77. The reliability coefficient is above 0.800 across all populations. As can be seen in Table 11.77, the scale T4STESE has a generally good model fit, with the CFI, TLI and SRMR all within the cut-off criteria for all participants. The RMSEA exceeds 0.100 in the ISCED level 2 population in Bulgaria, Chile, Costa Rica, Israel, Shanghai (China), Singapore and Viet Nam; in the ISCED level 1 population in Japan and Slovenia, and in the ISCED level 3 population in Türkiye.

Table 11.78 presents the results from the measurement invariance testing for T4STESE for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all indices. The degree of change between the equal loadings and the equal loadings and thresholds models is close the acceptable range for the CFI, TLI and RMSEA and exceeds the cut-off criterion for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.79 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4STESE. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.76. Items and response categories used in the construction of scale T4STESE**

| Scale or item | Question or item wording                                                                                                                                                                             |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4STESE       | To what extent can you do the following activities related to environmental sustainability?                                                                                                          |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i>                                                                                               |
|               | Scale mid-point: 2.5                                                                                                                                                                                 |
| TT4G39C       | Empower students to adopt pro-environmental behaviours (e.g. reduced consumption, ethical consumption, reusing, recycling)                                                                           |
| TT4G39D       | Empower students to participate in activities in favour of environmental protection (e.g. writing letters to newspapers, posting on social media, signing petitions, talking with peers and parents) |
| TT4G39E       | Help students identify misconceptions and disinformation about environmental sustainability issues                                                                                                   |
| TT4G39G       | Help students translate their knowledge on climate change into actions                                                                                                                               |

Source: OECD, TALIS 2024 database.

**Table 11.77. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4STESE**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.877            | 0.996         | 0.989 | 0.070        | 0.012 |
| Alberta (Canada)                | 0.944            | 1.000         | 0.999 | 0.026        | 0.004 |
| Australia                       | 0.934            | 0.999         | 0.998 | 0.058        | 0.005 |
| Austria                         | 0.873            | 0.997         | 0.990 | 0.073        | 0.011 |
| Azerbaijan                      | 0.827            | 0.993         | 0.978 | 0.087        | 0.014 |
| Bahrain                         | 0.911            | 0.998         | 0.993 | 0.087        | 0.010 |
| Belgium                         | 0.890            | 0.999         | 0.998 | 0.039        | 0.006 |
| Flemish Community (Belgium)     | 0.880            | 0.999         | 0.998 | 0.038        | 0.007 |
| French Community (Belgium)      | 0.888            | 0.996         | 0.987 | 0.093        | 0.015 |
| Brazil                          | 0.934            | 1.000         | 0.999 | 0.037        | 0.004 |
| Bulgaria                        | 0.929            | 0.996         | 0.988 | <b>0.133</b> | 0.013 |
| Chile                           | 0.948            | 0.997         | 0.990 | <b>0.131</b> | 0.014 |
| Colombia                        | 0.933            | 0.999         | 0.997 | 0.067        | 0.007 |
| Costa Rica                      | 0.947            | 0.996         | 0.987 | <b>0.177</b> | 0.013 |
| Croatia                         | 0.919            | 1.000         | 0.999 | 0.041        | 0.005 |
| Cyprus                          | 0.928            | 0.998         | 0.994 | 0.097        | 0.009 |
| Czechia                         | 0.879            | 1.000         | 0.999 | 0.025        | 0.004 |
| Denmark                         | 0.886            | 0.997         | 0.990 | 0.080        | 0.011 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Estonia                         | 0.864                           | 1.000         | 1.000 | 0.009        | 0.004 |
| Finland                         | 0.844                           | 0.996         | 0.987 | 0.065        | 0.016 |
| France                          | 0.896                           | 0.999         | 0.996 | 0.061        | 0.008 |
| Hungary                         | 0.906                           | 1.000         | 1.000 | 0.000        | 0.002 |
| Iceland                         | 0.924                           | 0.999         | 0.997 | 0.070        | 0.007 |
| Israel                          | 0.937                           | 0.996         | 0.989 | <b>0.135</b> | 0.014 |
| Italy                           | 0.918                           | 1.000         | 1.000 | 0.011        | 0.003 |
| Japan                           | 0.910                           | 1.000         | 0.999 | 0.041        | 0.004 |
| Kazakhstan                      | 0.848                           | 0.996         | 0.987 | 0.066        | 0.012 |
| Korea                           | 0.947                           | 0.999         | 0.998 | 0.076        | 0.006 |
| Kosovo                          | 0.900                           | 0.997         | 0.992 | 0.077        | 0.011 |
| Latvia                          | 0.881                           | 1.000         | 0.999 | 0.024        | 0.005 |
| Lithuania                       | 0.890                           | 1.000         | 1.000 | 0.000        | 0.001 |
| Malta                           | 0.931                           | 0.999         | 0.998 | 0.068        | 0.006 |
| Montenegro                      | 0.942                           | 1.000         | 0.999 | 0.038        | 0.003 |
| Morocco                         | 0.917                           | 0.999         | 0.998 | 0.036        | 0.005 |
| Netherlands                     | 0.891                           | 0.995         | 0.984 | 0.093        | 0.016 |
| New Zealand                     | 0.915                           | 0.998         | 0.993 | 0.091        | 0.011 |
| North Macedonia                 | 0.924                           | 0.998         | 0.995 | 0.083        | 0.008 |
| Norway                          | 0.890                           | 0.999         | 0.997 | 0.044        | 0.007 |
| Poland                          | 0.916                           | 1.000         | 1.000 | 0.010        | 0.003 |
| Portugal                        | 0.924                           | 0.999         | 0.997 | 0.058        | 0.007 |
| Romania                         | 0.936                           | 0.999         | 0.997 | 0.071        | 0.007 |
| Saudi Arabia                    | 0.927                           | 0.999         | 0.997 | 0.065        | 0.005 |
| Serbia                          | 0.914                           | 1.000         | 0.999 | 0.042        | 0.005 |
| Shanghai (China)                | 0.955                           | 0.998         | 0.995 | <b>0.158</b> | 0.007 |
| Singapore                       | 0.938                           | 0.995         | 0.985 | <b>0.163</b> | 0.013 |
| Slovak Republic                 | 0.895                           | 0.998         | 0.995 | 0.062        | 0.008 |
| Slovenia                        | 0.867                           | 0.999         | 0.996 | 0.044        | 0.008 |
| South Africa                    | 0.928                           | 0.999         | 0.997 | 0.063        | 0.007 |
| Spain                           | 0.922                           | 0.997         | 0.992 | 0.083        | 0.010 |
| Sweden                          | 0.893                           | 0.999         | 0.996 | 0.052        | 0.007 |
| Türkiye                         | 0.911                           | 0.998         | 0.995 | 0.083        | 0.009 |
| United Arab Emirates            | 0.947                           | 0.999         | 0.996 | 0.062        | 0.006 |
| United States                   | 0.945                           | 0.999         | 0.996 | 0.070        | 0.009 |
| Uzbekistan                      | 0.812                           | 0.993         | 0.979 | 0.076        | 0.016 |
| Viet Nam                        | 0.887                           | 0.986         | 0.958 | <b>0.203</b> | 0.023 |
| International pooled data       | 0.923                           | 0.999         | 0.998 | 0.041        | 0.004 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.921                           | 1.000         | 1.000 | 0.022        | 0.003 |
| Belgium                         | 0.860                           | 0.997         | 0.991 | 0.069        | 0.012 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Flemish Community (Belgium)     | 0.848                           | 0.994         | 0.983 | 0.091        | 0.016 |
| French Community (Belgium)      | 0.861                           | 0.997         | 0.991 | 0.068        | 0.014 |
| Brazil                          | 0.913                           | 0.998         | 0.995 | 0.055        | 0.009 |
| France                          | 0.860                           | 0.995         | 0.986 | 0.078        | 0.014 |
| Japan                           | 0.916                           | 0.996         | 0.988 | <b>0.118</b> | 0.013 |
| Korea                           | 0.934                           | 0.999         | 0.998 | 0.067        | 0.007 |
| Morocco                         | 0.884                           | 0.999         | 0.998 | 0.029        | 0.006 |
| Netherlands                     | 0.881                           | 0.996         | 0.989 | 0.092        | 0.018 |
| New Zealand                     | 0.901                           | 0.999         | 0.997 | 0.047        | 0.008 |
| Saudi Arabia                    | 0.920                           | 0.999         | 0.996 | 0.069        | 0.007 |
| Slovenia                        | 0.868                           | 0.991         | 0.972 | <b>0.126</b> | 0.020 |
| Spain                           | 0.907                           | 0.999         | 0.997 | 0.039        | 0.006 |
| Türkiye                         | 0.912                           | 0.998         | 0.994 | 0.076        | 0.010 |
| United Arab Emirates            | 0.939                           | 0.998         | 0.994 | 0.078        | 0.008 |
| International pooled data       | 0.917                           | 0.999         | 0.998 | 0.048        | 0.005 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.938                           | 0.999         | 0.997 | 0.078        | 0.006 |
| Denmark                         | 0.901                           | 1.000         | 1.000 | 0.000        | 0.003 |
| Flemish Community (Belgium)     | 0.876                           | 0.999         | 0.996 | 0.053        | 0.008 |
| Portugal                        | 0.923                           | 0.999         | 0.996 | 0.072        | 0.008 |
| Saudi Arabia                    | 0.935                           | 0.998         | 0.995 | 0.095        | 0.007 |
| Slovenia                        | 0.902                           | 0.999         | 0.996 | 0.055        | 0.007 |
| Türkiye                         | 0.918                           | 0.998         | 0.993 | <b>0.105</b> | 0.010 |
| United Arab Emirates            | 0.958                           | 0.998         | 0.994 | 0.097        | 0.008 |
| International pooled data       | 0.932                           | 0.999         | 0.998 | 0.051        | 0.005 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.78. Measurement invariance results from MGCFA for scale T4STESE with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.998     | 0.994 | 0.080 | 0.008 | -                       | -      | -       | -      |
| Equal loadings                | 0.997     | 0.996 | 0.069 | 0.015 | -0.002                  | 0.002  | -0.012  | 0.007  |
| Equal loadings and thresholds | 0.981     | 0.990 | 0.104 | 0.099 | -0.015                  | -0.005 | 0.035   | 0.084  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.79. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4STESE**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G39C | 0.836   | -1.735      | -0.490      | 0.566       |
| TT4G39D | 0.856   | -1.159      | -0.099      | 0.822       |
| TT4G39E | 0.890   | -1.499      | -0.341      | 0.720       |
| TT4G39G | 0.879   | -1.376      | -0.229      | 0.745       |

Source: OECD, TALIS 2024 database.

### Confidence to teach about climate change (T4TCHCLC)

The scale of *Confidence to teach about climate change* (T4TCHCLC) was constructed from four items (TT4G40A, TT4G40B, TT4G40D and TT4G40E), which are described in Table 11.80. Teachers had to indicate their level of agreement with these four items, with the following available response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale reflect higher teacher confidence in teaching about climate change.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.81. The reliabilities for T4TCHCLC are generally high, mostly above 0.800 in all populations. In terms of model fit, the CFI indicates a good model fit across all populations, whereas the TLI does not reach the cut-off criterion only in the ISCED level 1 population in Slovenia. The RMSEA is greater than 0.100 in 17 of the ISCED level 2 populations, particularly in Hungary, Slovenia and Viet Nam; in 5 of the ISCED level 1 populations, particularly in Slovenia; and in the ISCED level 3 population in Saudi Arabia and Slovenia. The SRMR does not exceed the cut-off criterion in any of the populations.

Table 11.82 presents the results from the measurement invariance testing for T4TCHCLC for the ISCED level 2 population. The baseline model shows an acceptable model fit with the exception of the RMSEA which is very close to the cut-off. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the RMSEA and SRMR and close to the cut-off criteria for the CFI and TLI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criteria for the TLI and RMSEA and exceeds the cut-off criteria for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.83 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4TCHCLC. All items show high loadings, except for item TT4G40E, which has a lower loading but is still within the acceptable range. Results by participating country/territory show a low loading for item TT4G40E in 20 ISCED level 2 participating countries/territories, particularly in Denmark, Finland and Norway; in 4 ISCED level 1 participating countries/territories (Belgium, the Flemish Community of Belgium, France and the Netherlands); and 3 ISCED level 3 participating countries/territories (Denmark, the Flemish Community of Belgium and Portugal).

**Table 11.80. Items and response categories used in the construction of scale T4TCHCLC**

| Scale or item | Question or item wording                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------|
| T4TCHCLC      | Thinking about climate change, how strongly do you agree or disagree with the following statements?        |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i> |
|               | Scale mid-point: 2.5                                                                                       |
| TT4G40A       | I feel confident in my ability to answer students' questions about climate change.                         |
| TT4G40B       | I have the resources I need to teach about climate change.                                                 |
| TT4G40D       | I am comfortable providing instruction on climate change.                                                  |
| TT4G40E       | My <school management team> encourages us to empower students to take action on climate change.            |

Source: OECD, TALIS 2024 database.



**Table 11.81. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4TCHCLC**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.889            | 0.997         | 0.991 | 0.084        | 0.014 |
| Alberta (Canada)                | 0.862            | 0.993         | 0.980 | <b>0.114</b> | 0.021 |
| Australia                       | 0.831            | 0.992         | 0.976 | <b>0.170</b> | 0.029 |
| Austria                         | 0.773            | 0.993         | 0.978 | 0.088        | 0.021 |
| Azerbaijan                      | 0.781            | 0.998         | 0.995 | 0.032        | 0.007 |
| Bahrain                         | 0.884            | 0.991         | 0.972 | <b>0.165</b> | 0.019 |
| Belgium                         | 0.822            | 0.999         | 0.998 | 0.044        | 0.009 |
| Flemish Community (Belgium)     | 0.822            | 0.998         | 0.994 | 0.073        | 0.015 |
| French Community (Belgium)      | 0.826            | 1.000         | 0.999 | 0.037        | 0.007 |
| Brazil                          | 0.855            | 0.997         | 0.990 | 0.090        | 0.014 |
| Bulgaria                        | 0.839            | 0.995         | 0.984 | 0.092        | 0.015 |
| Chile                           | 0.845            | 0.998         | 0.995 | 0.048        | 0.014 |
| Colombia                        | 0.800            | 0.996         | 0.988 | 0.053        | 0.013 |
| Costa Rica                      | 0.832            | 0.995         | 0.986 | 0.084        | 0.017 |
| Croatia                         | 0.851            | 1.000         | 0.999 | 0.031        | 0.007 |
| Cyprus                          | 0.877            | 1.000         | 1.000 | 0.022        | 0.005 |
| Czechia                         | 0.838            | 0.999         | 0.997 | 0.056        | 0.010 |
| Denmark                         | 0.807            | 0.999         | 0.996 | 0.074        | 0.015 |
| Estonia                         | 0.826            | 0.993         | 0.979 | <b>0.122</b> | 0.021 |
| Finland                         | 0.819            | 0.998         | 0.993 | <b>0.116</b> | 0.020 |
| France                          | 0.824            | 0.998         | 0.994 | 0.084        | 0.016 |
| Hungary                         | 0.829            | 0.986         | 0.958 | <b>0.171</b> | 0.031 |
| Iceland                         | 0.799            | 0.995         | 0.986 | <b>0.103</b> | 0.020 |
| Israel                          | 0.877            | 1.000         | 1.000 | 0.000        | 0.002 |
| Italy                           | 0.840            | 0.999         | 0.996 | 0.069        | 0.011 |
| Japan                           | 0.841            | 0.999         | 0.998 | 0.066        | 0.011 |
| Kazakhstan                      | 0.803            | 0.989         | 0.968 | 0.089        | 0.020 |
| Korea                           | 0.875            | 0.992         | 0.977 | <b>0.152</b> | 0.018 |
| Kosovo                          | 0.864            | 0.991         | 0.973 | <b>0.138</b> | 0.022 |
| Latvia                          | 0.716            | 0.998         | 0.995 | 0.042        | 0.011 |
| Lithuania                       | 0.860            | 0.997         | 0.992 | 0.070        | 0.015 |
| Malta                           | 0.863            | 1.000         | 0.999 | 0.041        | 0.006 |
| Montenegro                      | 0.885            | 0.999         | 0.998 | 0.048        | 0.007 |
| Morocco                         | 0.857            | 0.993         | 0.980 | 0.082        | 0.017 |
| Netherlands                     | 0.817            | 1.000         | 1.001 | 0.000        | 0.004 |
| New Zealand                     | 0.829            | 0.985         | 0.956 | <b>0.173</b> | 0.031 |
| North Macedonia                 | 0.847            | 0.987         | 0.962 | <b>0.146</b> | 0.020 |
| Norway                          | 0.753            | 0.994         | 0.983 | 0.092        | 0.023 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Poland                          | 0.860                           | 0.998         | 0.994        | 0.066        | 0.011 |
| Portugal                        | 0.845                           | 0.999         | 0.998        | 0.057        | 0.011 |
| Romania                         | 0.856                           | 1.000         | 0.999        | 0.024        | 0.005 |
| Saudi Arabia                    | 0.876                           | 0.993         | 0.979        | <b>0.123</b> | 0.015 |
| Serbia                          | 0.866                           | 0.994         | 0.983        | <b>0.112</b> | 0.014 |
| Shanghai (China)                | 0.922                           | 0.998         | 0.995        | <b>0.101</b> | 0.008 |
| Singapore                       | 0.862                           | 0.995         | 0.986        | <b>0.104</b> | 0.018 |
| Slovak Republic                 | 0.849                           | 0.996         | 0.987        | 0.080        | 0.014 |
| Slovenia                        | 0.842                           | 0.977         | 0.931        | <b>0.168</b> | 0.031 |
| South Africa                    | 0.834                           | 0.995         | 0.985        | 0.076        | 0.016 |
| Spain                           | 0.805                           | 0.998         | 0.994        | 0.048        | 0.011 |
| Sweden                          | 0.836                           | 1.000         | 1.000        | 0.019        | 0.006 |
| Türkiye                         | 0.853                           | 1.000         | 1.000        | 0.018        | 0.004 |
| United Arab Emirates            | 0.898                           | 0.998         | 0.994        | 0.050        | 0.009 |
| United States                   | 0.850                           | 0.996         | 0.987        | 0.086        | 0.020 |
| Uzbekistan                      | 0.827                           | 0.994         | 0.982        | 0.084        | 0.014 |
| Viet Nam                        | 0.891                           | 0.978         | 0.935        | <b>0.273</b> | 0.035 |
| International pooled data       | 0.846                           | 0.999         | 0.996        | 0.047        | 0.008 |
| <b>ISCED level 1</b>            |                                 |               |              |              |       |
| Australia                       | 0.858                           | 0.993         | 0.979        | <b>0.141</b> | 0.024 |
| Belgium                         | 0.821                           | 0.999         | 0.998        | 0.041        | 0.008 |
| Flemish Community (Belgium)     | 0.792                           | 0.997         | 0.992        | 0.062        | 0.013 |
| French Community (Belgium)      | 0.845                           | 1.000         | 1.000        | 0.020        | 0.005 |
| Brazil                          | 0.848                           | 0.997         | 0.991        | 0.062        | 0.012 |
| France                          | 0.796                           | 0.994         | 0.981        | <b>0.112</b> | 0.024 |
| Japan                           | 0.835                           | 0.997         | 0.991        | <b>0.101</b> | 0.020 |
| Korea                           | 0.870                           | 0.996         | 0.987        | 0.094        | 0.014 |
| Morocco                         | 0.801                           | 0.994         | 0.982        | 0.060        | 0.015 |
| Netherlands                     | 0.760                           | 0.961         | <b>0.882</b> | <b>0.175</b> | 0.035 |
| New Zealand                     | 0.835                           | 0.996         | 0.988        | 0.070        | 0.016 |
| Saudi Arabia                    | 0.874                           | 0.989         | 0.968        | <b>0.157</b> | 0.022 |
| Slovenia                        | 0.800                           | 0.964         | <b>0.892</b> | <b>0.183</b> | 0.034 |
| Spain                           | 0.799                           | 0.996         | 0.989        | 0.053        | 0.014 |
| Türkiye                         | 0.867                           | 0.999         | 0.997        | 0.042        | 0.007 |
| United Arab Emirates            | 0.876                           | 0.994         | 0.981        | 0.099        | 0.017 |
| International pooled data       | 0.844                           | 0.999         | 0.997        | 0.036        | 0.006 |
| <b>ISCED level 3</b>            |                                 |               |              |              |       |
| Croatia                         | 0.877                           | 1.000         | 0.999        | 0.035        | 0.006 |
| Denmark                         | 0.844                           | 1.000         | 0.999        | 0.030        | 0.007 |
| Flemish Community (Belgium)     | 0.806                           | 0.997         | 0.992        | 0.080        | 0.017 |
| Portugal                        | 0.857                           | 1.000         | 0.999        | 0.038        | 0.007 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.886                           | 0.993         | 0.978 | <b>0.140</b> | 0.019 |
| Slovenia                        | 0.821                           | 0.980         | 0.940 | <b>0.167</b> | 0.028 |
| Türkiye                         | 0.840                           | 0.999         | 0.998 | 0.035        | 0.006 |
| United Arab Emirates            | 0.906                           | 0.997         | 0.991 | 0.078        | 0.015 |
| International pooled data       | 0.862                           | 0.999         | 0.998 | 0.035        | 0.006 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.82. Measurement invariance results from MGCFA for scale T4TCHCLC with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.996     | 0.987 | 0.101 | 0.015 | -                       | -      | -       | -      |
| Equal loadings                | 0.982     | 0.979 | 0.131 | 0.042 | -0.013                  | -0.009 | 0.030   | 0.028  |
| Equal loadings and thresholds | 0.962     | 0.981 | 0.124 | 0.139 | -0.020                  | 0.002  | -0.007  | 0.097  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.83. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4TCHCLC**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G40A | 0.864   | -1.924      | -0.753      | 0.886       |
| TT4G40B | 0.850   | -1.493      | -0.182      | 1.116       |
| TT4G40D | 0.839   | -1.529      | -0.441      | 0.954       |
| TT4G40E | 0.524   | -1.244      | -0.325      | 1.087       |

Source: OECD, TALIS 2024 database.

### Clarity of instruction (T4CLAIN)

The scale of *Clarity of instruction* (T4CLAIN) was measured by a set of four items (TT4G51A, TT4G51B, TT4G51C and TT4G51D). Teachers had to indicate the frequency with which they carried out different activities described in Table 11.84, using the following response categories: “Never or almost never”, “Occasionally”, “Frequently” and “Always”. Higher values on this scale indicate a higher frequency of clarity of instruction activities.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.85. As can be seen, reliability for T4CLAIN is high in most participants, with none of them below the established cut-off criterion in any ISCED level. In terms of CFA model fit, the CFI and SRMR for T4CLAIN are all within the acceptable cut-off criteria in all populations. The TLI is acceptable in most countries or territories, except for 12 ISCED level 2 participants (Austria, Belgium, Czechia, Denmark, Finland, Iceland, Italy, the Netherlands, Norway, the Slovak Republic and Slovenia) and the ISCED level 1 population in Morocco. The RMSEA exceeds the cut-off criterion in 28 of the ISCED level 2 participants,

particularly in Finland and Italy; in 6 ISCED level 1 participants (Australia, Belgium, Brazil, the French Community of Belgium, Korea and the Netherlands) and in 5 ISCED level 3 participants (Croatia, Denmark, Portugal, Slovenia and Türkiye).

Table 11.86 presents the results from the measurement invariance testing for T4CLAIN for the ISCED level 2 population. The baseline model shows an acceptable model fit with the exception of the RMSEA. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the CFI, TLI and RMSEA. The degree of change between the equal loadings and the equal loadings and thresholds models is close to the cut-off criteria for the TLI and RMSEA and exceeds the cut-off criteria for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.87 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4CLAIN. All items show high loadings. Results by participating country/territory indicate low loadings for item TT4G51A in the ISCED level 2 population in Austria, Belgium, Croatia, the Flemish Community of Belgium, Iceland and Morocco; in the ISCED level 1 population in Belgium; and in the ISCED levels 1 and 3 populations in the Flemish Community of Belgium. Item TT4G51D had also a low loading in the Netherlands (ISCED level 2).

**Table 11.84. Items and response categories used in the construction of scale T4CLAIN**

| Scale or item | Question or item wording                                                                                        |
|---------------|-----------------------------------------------------------------------------------------------------------------|
| T4CLAIN       | Thinking about your teaching in the <target class>, how often do you do the following?                          |
|               | <i>Recoded response categories for scaling: 1=Never or almost never; 2=Occasionally; 3=Frequently; 4=Always</i> |
|               | Scale mid-point: 2.5                                                                                            |
| TT4G51A       | I present a summary of recently learned content.                                                                |
| TT4G51B       | I set goals at the beginning of a lesson or a unit.                                                             |
| TT4G51C       | I explain what I expect the students to learn.                                                                  |
| TT4G51D       | I explain how new and old topics are related.                                                                   |

Source: OECD, TALIS 2024 database.

**Table 11.85. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4CLAIN**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |              |              |       |
| Albania                         | 0.804            | 0.992         | 0.975        | 0.059        | 0.019 |
| Alberta (Canada)                | 0.826            | 0.971         | 0.913        | <b>0.130</b> | 0.031 |
| Australia                       | 0.820            | 0.986         | 0.957        | <b>0.117</b> | 0.027 |
| Austria                         | 0.668            | 0.937         | <b>0.812</b> | <b>0.147</b> | 0.043 |
| Azerbaijan                      | 0.772            | 0.992         | 0.975        | 0.061        | 0.015 |
| Bahrain                         | 0.850            | 0.993         | 0.979        | 0.070        | 0.018 |
| Belgium                         | 0.694            | 0.953         | <b>0.859</b> | <b>0.117</b> | 0.036 |
| Flemish Community (Belgium)     | 0.687            | 0.979         | 0.937        | 0.075        | 0.024 |
| French Community (Belgium)      | 0.756            | 0.940         | <b>0.820</b> | <b>0.172</b> | 0.044 |
| Brazil                          | 0.847            | 0.987         | 0.962        | <b>0.108</b> | 0.025 |
| Bulgaria                        | 0.795            | 0.989         | 0.966        | 0.076        | 0.024 |
| Chile                           | 0.813            | 0.975         | 0.925        | 0.091        | 0.033 |
| Colombia                        | 0.815            | 0.985         | 0.954        | 0.090        | 0.025 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Costa Rica                      | 0.777                           | 0.975         | 0.924        | <b>0.111</b> | 0.031 |
| Croatia                         | 0.764                           | 0.987         | 0.962        | 0.077        | 0.022 |
| Cyprus                          | 0.836                           | 0.986         | 0.957        | <b>0.124</b> | 0.030 |
| Czechia                         | 0.777                           | 0.956         | <b>0.869</b> | <b>0.165</b> | 0.044 |
| Denmark                         | 0.715                           | 0.958         | <b>0.873</b> | <b>0.126</b> | 0.033 |
| Estonia                         | 0.824                           | 0.981         | 0.944        | <b>0.130</b> | 0.027 |
| Finland                         | 0.795                           | 0.943         | <b>0.828</b> | <b>0.220</b> | 0.057 |
| France                          | 0.757                           | 0.972         | 0.915        | <b>0.118</b> | 0.030 |
| Hungary                         | 0.805                           | 0.996         | 0.988        | 0.050        | 0.013 |
| Iceland                         | 0.773                           | 0.966         | <b>0.897</b> | <b>0.178</b> | 0.039 |
| Israel                          | 0.824                           | 0.988         | 0.964        | 0.096        | 0.024 |
| Italy                           | 0.774                           | 0.938         | <b>0.815</b> | <b>0.195</b> | 0.049 |
| Japan                           | 0.772                           | 0.968         | 0.903        | <b>0.136</b> | 0.032 |
| Kazakhstan                      | 0.826                           | 0.996         | 0.988        | 0.044        | 0.014 |
| Korea                           | 0.878                           | 0.996         | 0.987        | 0.087        | 0.015 |
| Kosovo                          | 0.866                           | 0.987         | 0.961        | <b>0.104</b> | 0.023 |
| Latvia                          | 0.835                           | 0.996         | 0.987        | 0.053        | 0.016 |
| Lithuania                       | 0.838                           | 0.995         | 0.985        | 0.073        | 0.019 |
| Malta                           | 0.800                           | 0.987         | 0.962        | <b>0.128</b> | 0.028 |
| Montenegro                      | 0.856                           | 0.988         | 0.963        | <b>0.121</b> | 0.024 |
| Morocco                         | 0.724                           | 0.987         | 0.960        | 0.055        | 0.021 |
| Netherlands                     | 0.685                           | 0.953         | <b>0.858</b> | <b>0.117</b> | 0.043 |
| New Zealand                     | 0.770                           | 0.985         | 0.956        | 0.092        | 0.025 |
| North Macedonia                 | 0.868                           | 0.991         | 0.972        | <b>0.116</b> | 0.023 |
| Norway                          | 0.707                           | 0.928         | <b>0.783</b> | <b>0.172</b> | 0.057 |
| Poland                          | 0.824                           | 0.987         | 0.962        | 0.077        | 0.022 |
| Portugal                        | 0.775                           | 0.974         | 0.923        | <b>0.113</b> | 0.031 |
| Romania                         | 0.824                           | 0.991         | 0.974        | 0.083        | 0.020 |
| Saudi Arabia                    | 0.934                           | 0.999         | 0.997        | 0.051        | 0.007 |
| Serbia                          | 0.865                           | 0.992         | 0.975        | 0.098        | 0.021 |
| Shanghai (China)                | 0.924                           | 0.998         | 0.995        | <b>0.103</b> | 0.011 |
| Singapore                       | 0.851                           | 0.984         | 0.952        | <b>0.157</b> | 0.031 |
| Slovak Republic                 | 0.799                           | 0.965         | <b>0.896</b> | <b>0.161</b> | 0.042 |
| Slovenia                        | 0.775                           | 0.955         | <b>0.865</b> | <b>0.163</b> | 0.043 |
| South Africa                    | 0.832                           | 0.993         | 0.978        | 0.069        | 0.018 |
| Spain                           | 0.782                           | 0.971         | 0.913        | 0.100        | 0.033 |
| Sweden                          | 0.786                           | 0.984         | 0.951        | 0.097        | 0.022 |
| Türkiye                         | 0.905                           | 0.996         | 0.988        | 0.094        | 0.014 |
| United Arab Emirates            | 0.856                           | 0.995         | 0.985        | 0.050        | 0.020 |
| United States                   | 0.829                           | 0.982         | 0.946        | 0.099        | 0.030 |
| Uzbekistan                      | 0.883                           | 0.996         | 0.987        | 0.084        | 0.014 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Viet Nam                        | 0.866                           | 0.988         | 0.963        | <b>0.142</b> | 0.022 |
| International pooled data       | 0.817                           | 0.985         | 0.956        | 0.097        | 0.024 |
| <b>ISCED level 1</b>            |                                 |               |              |              |       |
| Australia                       | 0.841                           | 0.991         | 0.972        | <b>0.104</b> | 0.022 |
| Belgium                         | 0.741                           | 0.969         | 0.907        | <b>0.131</b> | 0.030 |
| Flemish Community (Belgium)     | 0.754                           | 0.989         | 0.967        | 0.081        | 0.018 |
| French Community (Belgium)      | 0.777                           | 0.975         | 0.926        | <b>0.133</b> | 0.033 |
| Brazil                          | 0.798                           | 0.982         | 0.946        | 0.100        | 0.026 |
| France                          | 0.784                           | 0.992         | 0.975        | 0.078        | 0.021 |
| Japan                           | 0.814                           | 0.989         | 0.967        | 0.088        | 0.022 |
| Korea                           | 0.877                           | 0.988         | 0.964        | <b>0.140</b> | 0.026 |
| Morocco                         | 0.718                           | 0.961         | <b>0.884</b> | 0.088        | 0.034 |
| Netherlands                     | 0.802                           | 0.997         | 0.990        | 0.053        | 0.016 |
| New Zealand                     | 0.783                           | 0.988         | 0.964        | 0.090        | 0.027 |
| Saudi Arabia                    | 0.931                           | 1.000         | 0.999        | 0.032        | 0.005 |
| Slovenia                        | 0.778                           | 0.988         | 0.963        | 0.088        | 0.022 |
| Spain                           | 0.787                           | 0.987         | 0.960        | 0.073        | 0.024 |
| Türkiye                         | 0.896                           | 0.994         | 0.983        | 0.098        | 0.015 |
| United Arab Emirates            | 0.864                           | 0.998         | 0.993        | 0.040        | 0.016 |
| International pooled data       | 0.823                           | 0.990         | 0.969        | 0.090        | 0.021 |
| <b>ISCED level 3</b>            |                                 |               |              |              |       |
| Croatia                         | 0.783                           | 0.984         | 0.951        | <b>0.102</b> | 0.027 |
| Denmark                         | 0.730                           | 0.970         | 0.911        | <b>0.105</b> | 0.032 |
| Flemish Community (Belgium)     | 0.643                           | 0.970         | 0.909        | 0.090        | 0.027 |
| Portugal                        | 0.771                           | 0.967         | 0.901        | <b>0.131</b> | 0.034 |
| Saudi Arabia                    | 0.931                           | 0.998         | 0.995        | 0.067        | 0.010 |
| Slovenia                        | 0.787                           | 0.973         | 0.918        | <b>0.135</b> | 0.032 |
| Türkiye                         | 0.884                           | 0.992         | 0.976        | <b>0.122</b> | 0.020 |
| United Arab Emirates            | 0.876                           | 0.998         | 0.993        | 0.036        | 0.013 |
| International pooled data       | 0.826                           | 0.985         | 0.956        | <b>0.103</b> | 0.025 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.86. Measurement invariance results from MGCFA for scale T4CLAIN with differences in model fits across models for ISCED level 2**

| Invariance model     | Model fit |       |       |       | Difference in model fit |       |         |        |
|----------------------|-----------|-------|-------|-------|-------------------------|-------|---------|--------|
|                      | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b> |           |       |       |       |                         |       |         |        |
| Baseline             | 0.986     | 0.959 | 0.115 | 0.026 | -                       | -     | -       | -      |

| Invariance model              | Model fit |       |       |       | Difference in model fit |              |                |               |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------------|----------------|---------------|
|                               | CFI       | TLI   | RMSEA | SRMR  | $\Delta$ CFI            | $\Delta$ TLI | $\Delta$ RMSEA | $\Delta$ SRMR |
| Equal loadings                | 0.983     | 0.980 | 0.080 | 0.034 | -0.003                  | 0.021        | -0.034         | 0.008         |
| Equal loadings and thresholds | 0.937     | 0.968 | 0.101 | 0.115 | -0.046                  | -0.012       | 0.021          | 0.081         |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.87. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4CLAIN**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G51A | 0.612   | -2.048      | -0.911      | 0.367       |
| TT4G51B | 0.783   | -2.132      | -1.112      | -0.021      |
| TT4G51C | 0.833   | -2.376      | -1.402      | -0.104      |
| TT4G51D | 0.729   | -2.345      | -1.256      | 0.053       |

Source: OECD, TALIS 2024 database.

### Cognitive activation (T4COGAC)

Teachers answered four items measuring *Cognitive activation* (T4COGAC) practices. These items were TT4G51E, TT4G51F, TT4G51G and TT4G51H. Each item (described in Table 11.88) had four response categories: “Never or almost never”, “Occasionally”, “Frequently” and “Always”. Higher values on this scale indicate a higher frequency of cognitive activation practices.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.89. The reliabilities for T4COGAC are generally high, with values mostly above 0.700 across populations. As can be observed from Table 11.89, the CFI is within at least the acceptable range for most participants, apart from the ISCED level 2 population in the Netherlands and Sweden. The TLI, on the other hand, exceeds the cut-off criterion in approximately half of the participants in ISCED level 2 and in one-third each of the ISCED levels 1 and 3 participants. The RMSEA also exceeds the cut-off in most populations, particularly in Japan, Korea, the Netherlands, Portugal and Shanghai (China) for ISCED level 2; the Flemish Community of Belgium, Japan and Korea for ISCED level 1; and Portugal for ISCED level 3. The SRMR is within the cut-off criterion in all populations. Based on the single CFA model fit results, the scale T4COGAC works well across all populations except in the ISCED level 2 population in the Netherlands and Sweden, where the CFI, TLI and RMSEA do not meet the acceptable cut-off criteria.

Table 11.90 presents the results from the measurement invariance testing for T4COGAC for the ISCED level 2 population. The baseline model shows an acceptable model fit with the exception of the RMSEA. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the RMSEA and SRMR and close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all fit indices. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.91 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4COGAC. All items show high loadings, except item TT4G51E, whose loadings are within the acceptable range. Results by participating country/territory also show a low item loading for item TT4G51E in the ISCED level 2 population in Bulgaria, Kazakhstan and Lithuania, as well as in the ISCED level 1 population in Morocco. Item TT4G51G also has a low loading in the ISCED level 2 population in Belgium, Finland and Sweden and in the ISCED level 3 population in Denmark.

**Table 11.88. Items and response categories used in the construction of scale T4COGAC**

| Scale or item | Question or item wording                                                                                        |
|---------------|-----------------------------------------------------------------------------------------------------------------|
| T4COGAC       | Thinking about your teaching in the <target class>, how often do you do the following?                          |
|               | <i>Recoded response categories for scaling: 1=Never or almost never; 2=Occasionally; 3=Frequently; 4=Always</i> |
|               | Scale mid-point: 2.5                                                                                            |
| TT4G51E       | I present tasks for which there is no obvious solution.                                                         |
| TT4G51F       | I give tasks that require students to think critically.                                                         |
| TT4G51G       | I have students work in small groups to come up with a joint solution to a problem or task.                     |
| TT4G51H       | I ask students to decide on their own procedures for solving complex tasks.                                     |

Source: OECD, TALIS 2024 database.

**Table 11.89. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4COGAC**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 2                   |                  |               |       |       |       |
| Albania                         | 0.793            | 0.984         | 0.951 | 0.105 | 0.025 |
| Alberta (Canada)                | 0.751            | 0.993         | 0.979 | 0.046 | 0.017 |
| Australia                       | 0.770            | 0.995         | 0.985 | 0.056 | 0.012 |
| Austria                         | 0.706            | 0.967         | 0.902 | 0.111 | 0.029 |
| Azerbaijan                      | 0.743            | 0.976         | 0.927 | 0.105 | 0.024 |
| Bahrain                         | 0.851            | 0.994         | 0.982 | 0.091 | 0.017 |
| Belgium                         | 0.707            | 0.951         | 0.854 | 0.143 | 0.035 |
| Flemish Community (Belgium)     | 0.749            | 0.960         | 0.879 | 0.160 | 0.038 |
| French Community (Belgium)      | 0.650            | 0.961         | 0.884 | 0.101 | 0.027 |
| Brazil                          | 0.710            | 0.966         | 0.898 | 0.110 | 0.032 |
| Bulgaria                        | 0.689            | 0.957         | 0.871 | 0.123 | 0.034 |
| Chile                           | 0.791            | 0.930         | 0.789 | 0.178 | 0.044 |
| Colombia                        | 0.725            | 0.953         | 0.860 | 0.117 | 0.031 |
| Costa Rica                      | 0.784            | 0.985         | 0.954 | 0.086 | 0.019 |
| Croatia                         | 0.700            | 0.944         | 0.833 | 0.136 | 0.037 |
| Cyprus                          | 0.752            | 0.988         | 0.963 | 0.080 | 0.019 |
| Czechia                         | 0.662            | 0.959         | 0.878 | 0.103 | 0.029 |
| Denmark                         | 0.789            | 0.962         | 0.885 | 0.160 | 0.033 |
| Estonia                         | 0.720            | 0.956         | 0.869 | 0.134 | 0.032 |
| Finland                         | 0.737            | 0.981         | 0.942 | 0.102 | 0.025 |
| France                          | 0.661            | 0.900         | 0.700 | 0.181 | 0.045 |
| Hungary                         | 0.741            | 0.944         | 0.832 | 0.165 | 0.038 |
| Iceland                         | 0.711            | 0.959         | 0.877 | 0.142 | 0.030 |
| Israel                          | 0.795            | 0.954         | 0.861 | 0.194 | 0.045 |
| Italy                           | 0.721            | 0.953         | 0.860 | 0.153 | 0.034 |
| Japan                           | 0.788            | 0.922         | 0.765 | 0.276 | 0.058 |
| Kazakhstan                      | 0.701            | 0.966         | 0.899 | 0.101 | 0.031 |



| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Korea                           | 0.811                           | 0.948         | <b>0.843</b> | <b>0.245</b> | 0.046 |
| Kosovo                          | 0.775                           | 0.984         | 0.952        | 0.097        | 0.025 |
| Latvia                          | 0.724                           | 0.966         | <b>0.897</b> | <b>0.110</b> | 0.028 |
| Lithuania                       | 0.689                           | 0.995         | 0.986        | 0.038        | 0.012 |
| Malta                           | 0.802                           | 0.980         | 0.939        | <b>0.146</b> | 0.027 |
| Montenegro                      | 0.767                           | 0.967         | 0.902        | <b>0.152</b> | 0.029 |
| Morocco                         | 0.759                           | 0.963         | <b>0.888</b> | <b>0.119</b> | 0.035 |
| Netherlands                     | 0.748                           | <b>0.891</b>  | <b>0.672</b> | <b>0.225</b> | 0.051 |
| New Zealand                     | 0.719                           | 0.996         | 0.988        | 0.037        | 0.012 |
| North Macedonia                 | 0.790                           | 0.996         | 0.987        | 0.058        | 0.013 |
| Norway                          | 0.728                           | 0.952         | <b>0.855</b> | <b>0.148</b> | 0.037 |
| Poland                          | 0.768                           | 0.963         | <b>0.889</b> | <b>0.128</b> | 0.037 |
| Portugal                        | 0.794                           | 0.945         | <b>0.834</b> | <b>0.219</b> | 0.045 |
| Romania                         | 0.743                           | 0.978         | 0.934        | 0.096        | 0.026 |
| Saudi Arabia                    | 0.875                           | 0.992         | 0.975        | <b>0.139</b> | 0.024 |
| Serbia                          | 0.826                           | 0.973         | 0.919        | <b>0.168</b> | 0.029 |
| Shanghai (China)                | 0.865                           | 0.982         | 0.946        | <b>0.226</b> | 0.032 |
| Singapore                       | 0.839                           | 0.987         | 0.961        | <b>0.122</b> | 0.023 |
| Slovak Republic                 | 0.734                           | 0.991         | 0.974        | 0.060        | 0.014 |
| Slovenia                        | 0.696                           | 0.953         | <b>0.860</b> | <b>0.127</b> | 0.037 |
| South Africa                    | 0.818                           | 0.989         | 0.968        | 0.095        | 0.023 |
| Spain                           | 0.746                           | 0.953         | <b>0.859</b> | <b>0.130</b> | 0.035 |
| Sweden                          | 0.605                           | <b>0.899</b>  | <b>0.698</b> | <b>0.124</b> | 0.035 |
| Türkiye                         | 0.841                           | 0.998         | 0.995        | 0.049        | 0.010 |
| United Arab Emirates            | 0.826                           | 0.997         | 0.992        | 0.037        | 0.011 |
| United States                   | 0.771                           | 1.000         | 1.005        | 0.000        | 0.004 |
| Uzbekistan                      | 0.850                           | 0.998         | 0.994        | 0.049        | 0.010 |
| Viet Nam                        | 0.810                           | 0.993         | 0.978        | 0.091        | 0.015 |
| International pooled data       | 0.778                           | 0.978         | 0.934        | <b>0.112</b> | 0.025 |
| <b>ISCED level 1</b>            |                                 |               |              |              |       |
| Australia                       | 0.819                           | 0.993         | 0.978        | 0.087        | 0.016 |
| Belgium                         | 0.789                           | 0.951         | <b>0.853</b> | <b>0.195</b> | 0.044 |
| Flemish Community (Belgium)     | 0.807                           | 0.946         | <b>0.839</b> | <b>0.235</b> | 0.052 |
| French Community (Belgium)      | 0.770                           | 0.965         | <b>0.895</b> | <b>0.149</b> | 0.036 |
| Brazil                          | 0.728                           | 0.972         | 0.916        | 0.097        | 0.028 |
| France                          | 0.726                           | 0.957         | <b>0.871</b> | <b>0.132</b> | 0.033 |
| Japan                           | 0.817                           | 0.952         | <b>0.855</b> | <b>0.221</b> | 0.043 |
| Korea                           | 0.854                           | 0.977         | 0.932        | <b>0.200</b> | 0.042 |
| Morocco                         | 0.715                           | 0.946         | <b>0.839</b> | <b>0.137</b> | 0.041 |
| Netherlands                     | 0.849                           | 0.980         | 0.939        | <b>0.160</b> | 0.031 |
| New Zealand                     | 0.801                           | 0.999         | 0.996        | 0.036        | 0.011 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.876                           | 0.992         | 0.976        | <b>0.131</b> | 0.024 |
| Slovenia                        | 0.767                           | 0.980         | 0.939        | <b>0.111</b> | 0.026 |
| Spain                           | 0.805                           | 0.969         | 0.906        | <b>0.121</b> | 0.031 |
| Türkiye                         | 0.865                           | 0.998         | 0.995        | 0.059        | 0.010 |
| United Arab Emirates            | 0.792                           | 0.997         | 0.990        | 0.044        | 0.014 |
| International pooled data       | 0.809                           | 0.979         | 0.938        | <b>0.129</b> | 0.026 |
| <b>ISCED level 3</b>            |                                 |               |              |              |       |
| Croatia                         | 0.710                           | 0.969         | 0.906        | <b>0.111</b> | 0.026 |
| Denmark                         | 0.716                           | 0.985         | 0.955        | 0.079        | 0.022 |
| Flemish Community (Belgium)     | 0.752                           | 0.964         | <b>0.892</b> | <b>0.149</b> | 0.032 |
| Portugal                        | 0.789                           | 0.939         | <b>0.816</b> | <b>0.230</b> | 0.046 |
| Saudi Arabia                    | 0.868                           | 0.990         | 0.970        | <b>0.155</b> | 0.027 |
| Slovenia                        | 0.733                           | 0.948         | <b>0.844</b> | <b>0.159</b> | 0.039 |
| Türkiye                         | 0.840                           | 0.997         | 0.990        | 0.077        | 0.013 |
| United Arab Emirates            | 0.825                           | 0.995         | 0.985        | 0.057        | 0.018 |
| International pooled data       | 0.817                           | 0.982         | 0.947        | <b>0.128</b> | 0.023 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.90. Measurement invariance results from MGCFA for scale T4COGAC with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.975     | 0.925 | 0.132 | 0.028 | -                       | -      | -       | -      |
| Equal loadings                | 0.965     | 0.958 | 0.099 | 0.038 | -0.010                  | 0.033  | -0.033  | 0.009  |
| Equal loadings and thresholds | 0.812     | 0.904 | 0.149 | 0.162 | -0.153                  | -0.053 | 0.050   | 0.124  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.91. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4COGAC**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G51E | 0.588   | -0.736      | 0.229       | 1.154       |
| TT4G51F | 0.729   | -1.765      | -0.428      | 0.900       |
| TT4G51G | 0.701   | -1.593      | -0.145      | 1.089       |
| TT4G51H | 0.746   | -1.355      | -0.027      | 1.156       |

Source: OECD, TALIS 2024 database.

### **Classroom management (T4CLASM)**

The scale of *Classroom management (T4CLASM)* was measured by a set of four items (TT4G51I, TT4G51J, TT4G51K and TT4G51L). Teachers had to indicate the frequency with which they carried out

different classroom management practices as described in Table 11.92, using the following response categories: “Never or almost never”, “Occasionally”, “Frequently” and “Always”. Higher values on this scale indicate a higher frequency of classroom management practices.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.93. The reliabilities for T4CLASM are high in all populations, with values mostly above 0.800. As can be observed in Table 11.93, the CFI for T4CLASM are all within the acceptable cut-off criterion for all participants. The TLI exceeds the cut-off criterion only in the ISCED level 2 population in Kazakhstan. The RMSEA of most participants is high, particularly in the ISCED level 2 population in Montenegro, North Macedonia, Norway and Serbia, as well as in the ISCED level 1 population in Korea and the ISCED level 3 population in Croatia. The SRMR is below 0.050 in all populations.

Table 11.94 presents the results from the measurement invariance testing for T4CLASM for the ISCED level 2 population. The baseline model shows an acceptable model fit with the exception of the RMSEA. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA and SRMR and close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA and exceeds the cut-off criteria for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.95 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4CLASM. All items show high loadings. Results by participating country/territory indicate low loadings for item TT4G51L in Portugal (ISCED levels 2 and 3).

**Table 11.92. Items and response categories used in the construction of scale T4CLASM**

| Scale or item | Question or item wording                                                                                        |
|---------------|-----------------------------------------------------------------------------------------------------------------|
| T4CLASM       | Thinking about your teaching in the <target class>, how often do you do the following?                          |
|               | <i>Recoded response categories for scaling: 1=Never or almost never; 2=Occasionally; 3=Frequently; 4=Always</i> |
|               | Scale mid-point: 2.5                                                                                            |
| TT4G51I       | I tell students to follow classroom rules.                                                                      |
| TT4G51J       | I tell students to listen to what I say.                                                                        |
| TT4G51K       | I calm students who are disruptive.                                                                             |
| TT4G51L       | When the lesson begins, I tell students to quieten down quickly.                                                |

Source: OECD, TALIS 2024 database.

**Table 11.93. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4CLASM**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.877            | 0.986         | 0.958 | <b>0.129</b> | 0.030 |
| Alberta (Canada)                | 0.883            | 0.999         | 0.997 | 0.041        | 0.008 |
| Australia                       | 0.888            | 0.996         | 0.989 | <b>0.101</b> | 0.014 |
| Austria                         | 0.911            | 1.000         | 0.999 | 0.040        | 0.006 |
| Azerbaijan                      | 0.820            | 0.972         | 0.917 | <b>0.158</b> | 0.035 |
| Bahrain                         | 0.937            | 0.995         | 0.985 | <b>0.117</b> | 0.015 |
| Belgium                         | 0.862            | 0.995         | 0.986 | <b>0.115</b> | 0.025 |
| Flemish Community (Belgium)     | 0.856            | 0.999         | 0.998 | 0.048        | 0.011 |
| French Community (Belgium)      | 0.897            | 0.994         | 0.982 | <b>0.111</b> | 0.020 |

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| Brazil                          | 0.861            | 0.995         | 0.985        | 0.070        | 0.014 |
| Bulgaria                        | 0.888            | 0.997         | 0.992        | 0.075        | 0.013 |
| Chile                           | 0.897            | 0.992         | 0.976        | <b>0.102</b> | 0.023 |
| Colombia                        | 0.865            | 0.975         | 0.925        | <b>0.142</b> | 0.025 |
| Costa Rica                      | 0.892            | 0.991         | 0.972        | <b>0.110</b> | 0.017 |
| Croatia                         | 0.914            | 0.992         | 0.975        | <b>0.180</b> | 0.026 |
| Cyprus                          | 0.891            | 0.994         | 0.982        | <b>0.115</b> | 0.020 |
| Czechia                         | 0.873            | 0.987         | 0.962        | <b>0.167</b> | 0.024 |
| Denmark                         | 0.928            | 0.996         | 0.987        | <b>0.167</b> | 0.019 |
| Estonia                         | 0.914            | 0.996         | 0.988        | <b>0.153</b> | 0.021 |
| Finland                         | 0.923            | 0.997         | 0.992        | <b>0.121</b> | 0.014 |
| France                          | 0.896            | 0.996         | 0.988        | <b>0.107</b> | 0.016 |
| Hungary                         | 0.897            | 0.989         | 0.966        | <b>0.152</b> | 0.022 |
| Iceland                         | 0.842            | 1.000         | 1.001        | 0.000        | 0.003 |
| Israel                          | 0.882            | 0.987         | 0.960        | <b>0.144</b> | 0.028 |
| Italy                           | 0.871            | 0.993         | 0.978        | <b>0.124</b> | 0.020 |
| Japan                           | 0.931            | 0.995         | 0.986        | <b>0.153</b> | 0.016 |
| Kazakhstan                      | 0.807            | 0.963         | <b>0.889</b> | <b>0.173</b> | 0.047 |
| Korea                           | 0.916            | 0.992         | 0.977        | <b>0.166</b> | 0.021 |
| Kosovo                          | 0.887            | 0.982         | 0.945        | <b>0.155</b> | 0.028 |
| Latvia                          | 0.815            | 0.980         | 0.940        | <b>0.119</b> | 0.033 |
| Lithuania                       | 0.930            | 0.992         | 0.977        | <b>0.174</b> | 0.022 |
| Malta                           | 0.886            | 0.993         | 0.978        | <b>0.141</b> | 0.017 |
| Montenegro                      | 0.885            | 0.976         | 0.927        | <b>0.274</b> | 0.046 |
| Morocco                         | 0.855            | 0.988         | 0.965        | 0.090        | 0.027 |
| Netherlands                     | 0.849            | 0.999         | 0.996        | 0.045        | 0.015 |
| New Zealand                     | 0.887            | 0.996         | 0.988        | 0.089        | 0.014 |
| North Macedonia                 | 0.883            | 0.973         | 0.919        | <b>0.234</b> | 0.039 |
| Norway                          | 0.928            | 0.989         | 0.968        | <b>0.227</b> | 0.020 |
| Poland                          | 0.921            | 0.991         | 0.972        | <b>0.152</b> | 0.030 |
| Portugal                        | 0.790            | 0.999         | 0.998        | 0.034        | 0.010 |
| Romania                         | 0.903            | 0.984         | 0.953        | <b>0.164</b> | 0.033 |
| Saudi Arabia                    | 0.920            | 0.995         | 0.984        | <b>0.112</b> | 0.016 |
| Serbia                          | 0.905            | 0.988         | 0.964        | <b>0.209</b> | 0.029 |
| Shanghai (China)                | 0.923            | 0.998         | 0.993        | <b>0.113</b> | 0.010 |
| Singapore                       | 0.889            | 0.996         | 0.988        | 0.099        | 0.015 |
| Slovak Republic                 | 0.928            | 0.992         | 0.976        | <b>0.199</b> | 0.021 |
| Slovenia                        | 0.861            | 0.994         | 0.983        | 0.099        | 0.018 |
| South Africa                    | 0.889            | 0.989         | 0.966        | <b>0.125</b> | 0.025 |
| Spain                           | 0.880            | 0.998         | 0.994        | 0.067        | 0.014 |
| Sweden                          | 0.916            | 0.998         | 0.993        | 0.100        | 0.014 |
| Türkiye                         | 0.887            | 0.999         | 0.996        | 0.060        | 0.010 |

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| United Arab Emirates            | 0.929            | 0.998         | 0.995 | 0.045        | 0.009 |
| United States                   | 0.907            | 0.999         | 0.996 | 0.044        | 0.010 |
| Uzbekistan                      | 0.917            | 0.990         | 0.970 | <b>0.167</b> | 0.021 |
| Viet Nam                        | 0.826            | 1.000         | 0.999 | 0.024        | 0.006 |
| International pooled data       | 0.899            | 0.991         | 0.973 | <b>0.129</b> | 0.019 |
| <b>ISCED level 1</b>            |                  |               |       |              |       |
| Australia                       | 0.893            | 0.996         | 0.989 | 0.100        | 0.015 |
| Belgium                         | 0.862            | 0.990         | 0.970 | <b>0.126</b> | 0.026 |
| Flemish Community (Belgium)     | 0.866            | 0.995         | 0.985 | <b>0.102</b> | 0.020 |
| French Community (Belgium)      | 0.872            | 0.992         | 0.975 | <b>0.103</b> | 0.021 |
| Brazil                          | 0.819            | 0.996         | 0.988 | 0.056        | 0.017 |
| France                          | 0.892            | 0.997         | 0.992 | 0.080        | 0.014 |
| Japan                           | 0.923            | 0.991         | 0.973 | <b>0.181</b> | 0.024 |
| Korea                           | 0.924            | 0.992         | 0.975 | <b>0.212</b> | 0.022 |
| Morocco                         | 0.870            | 0.995         | 0.985 | 0.055        | 0.015 |
| Netherlands                     | 0.907            | 0.998         | 0.993 | 0.080        | 0.015 |
| New Zealand                     | 0.884            | 0.998         | 0.994 | 0.074        | 0.013 |
| Saudi Arabia                    | 0.936            | 0.994         | 0.983 | <b>0.118</b> | 0.015 |
| Slovenia                        | 0.873            | 0.997         | 0.992 | 0.070        | 0.011 |
| Spain                           | 0.876            | 1.000         | 0.999 | 0.022        | 0.006 |
| Türkiye                         | 0.897            | 1.000         | 0.999 | 0.020        | 0.004 |
| United Arab Emirates            | 0.926            | 0.994         | 0.981 | 0.097        | 0.017 |
| International pooled data       | 0.898            | 0.995         | 0.985 | 0.092        | 0.015 |
| <b>ISCED level 3</b>            |                  |               |       |              |       |
| Croatia                         | 0.912            | 0.988         | 0.965 | <b>0.231</b> | 0.032 |
| Denmark                         | 0.916            | 0.994         | 0.982 | <b>0.152</b> | 0.018 |
| Flemish Community (Belgium)     | 0.866            | 0.996         | 0.989 | <b>0.111</b> | 0.018 |
| Portugal                        | 0.793            | 0.989         | 0.968 | <b>0.121</b> | 0.028 |
| Saudi Arabia                    | 0.920            | 0.996         | 0.988 | 0.093        | 0.014 |
| Slovenia                        | 0.884            | 0.990         | 0.970 | <b>0.157</b> | 0.023 |
| Türkiye                         | 0.894            | 0.999         | 0.997 | 0.057        | 0.007 |
| United Arab Emirates            | 0.930            | 0.996         | 0.989 | 0.079        | 0.014 |
| International pooled data       | 0.917            | 0.995         | 0.986 | <b>0.130</b> | 0.016 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.94. Measurement invariance results from MGCFA for scale T4CLASM with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |       |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|-------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |
| ISCED level 2                 |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.993     | 0.978 | 0.136 | 0.021 | -                       | -     | -       | -      |
| Equal loadings                | 0.982     | 0.978 | 0.136 | 0.038 | -0.011                  | 0.000 | -0.000  | 0.017  |
| Equal loadings and thresholds | 0.961     | 0.980 | 0.130 | 0.127 | -0.021                  | 0.002 | -0.006  | 0.089  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.95. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4CLASM**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G51I | 0.852   | -1.873      | -0.905      | -0.023      |
| TT4G51J | 0.914   | -1.823      | -0.785      | 0.053       |
| TT4G51K | 0.838   | -1.682      | -0.641      | 0.147       |
| TT4G51L | 0.748   | -1.310      | -0.439      | 0.323       |

Source: OECD, TALIS 2024 database.

### Use of digital resources and tools for whole class instruction (T4DRTWCI)

Teachers answered four items targeting their *Use of digital resources and tools for whole class instruction* (T4DRTWCI). These items were TT4G52A, TT4G52E, TT4G52G and TT4G52K. Each item (described in Table 11.96) had four response categories: “Never or almost never”, “Occasionally”, “Frequently” and “Always”. Higher values on this scale indicate a higher use of digital resources and tools for whole class instruction.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.97. The reliabilities for T4DRTWCI are generally high (above 0.700 in most countries or territories), except for the ISCED level 2 population in Norway. As can be seen in Table 11.97, the CFI meets the cut-off criterion for all participants. This is also mostly the case for the TLI, except for Finland (ISCED level 2). The RMSEA exceeds the cut-off in the ISCED level 2 population in Bahrain, Costa Rica, Finland, Japan, Lithuania, Saudi Arabia, Shanghai (China) and Singapore; in the ISCED level 1 population in Korea and Saudi Arabia; and in the ISCED level 3 population in Saudi Arabia. The SRMR meets the cut-off criterion in all populations.

Table 11.98 presents the results from the measurement invariance testing for T4DRTWCI for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the RMSEA and SRMR and close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all fit indices. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.99 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4DRTWCI. All items show high loadings, with the exception of item TT4G52A, whose loading falls within the acceptable range. Results by participating country/territory show a low item loading for item TT4G52A in the ISCED level 2 population in Malta; in the ISCED level 1 population in France, the Netherlands and Slovenia; and in the ISCED level 3 population in the Flemish Community of Belgium. Item

TT4G52E also has a low loading in Czechia, Finland and Norway (ISCED level 2) and in Denmark (ISCED level 3).

**Table 11.96. Items and response categories used in the construction of scale T4DRTWCI**

| Scale or item | Question or item wording                                                                                                   |
|---------------|----------------------------------------------------------------------------------------------------------------------------|
| T4DRTWCI      | Thinking about your lessons in the <target class>, how often do you perform the following tasks?                           |
|               | <i>Recoded response categories for scaling: 1=Never or almost never; 2=Occasionally; 3=Frequently; 4=Always</i>            |
|               | Scale mid-point: 2.5                                                                                                       |
| TT4G52A       | Use <digital resources and tools> to present information through direct instruction                                        |
| TT4G52E       | Use <digital resources and tools> to enable collaboration with other classrooms, schools or experts outside of this school |
| TT4G52G       | Support collaboration among students using <digital resources and tools>                                                   |
| TT4G52K       | Give students problems that can only be solved by using <digital resources and tools>                                      |

Source: OECD, TALIS 2024 database.

**Table 11.97. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4DRTWCI**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |              |              |       |
| Albania                         | 0.768            | 0.996         | 0.987        | 0.050        | 0.012 |
| Alberta (Canada)                | 0.783            | 1.000         | 0.999        | 0.007        | 0.009 |
| Australia                       | 0.714            | 0.997         | 0.992        | 0.033        | 0.011 |
| Austria                         | 0.773            | 0.987         | 0.962        | 0.084        | 0.023 |
| Azerbaijan                      | 0.870            | 1.000         | 0.999        | 0.022        | 0.004 |
| Bahrain                         | 0.815            | 0.988         | 0.965        | <b>0.105</b> | 0.021 |
| Belgium                         | 0.754            | 0.991         | 0.973        | 0.054        | 0.018 |
| Flemish Community (Belgium)     | 0.732            | 0.992         | 0.976        | 0.051        | 0.018 |
| French Community (Belgium)      | 0.726            | 0.997         | 0.991        | 0.031        | 0.013 |
| Brazil                          | 0.832            | 0.995         | 0.984        | 0.069        | 0.015 |
| Bulgaria                        | 0.767            | 0.993         | 0.979        | 0.060        | 0.018 |
| Chile                           | 0.791            | 0.994         | 0.981        | 0.053        | 0.017 |
| Colombia                        | 0.824            | 0.992         | 0.977        | 0.075        | 0.020 |
| Costa Rica                      | 0.836            | 0.979         | 0.937        | <b>0.130</b> | 0.029 |
| Croatia                         | 0.796            | 1.000         | 0.999        | 0.015        | 0.006 |
| Cyprus                          | 0.785            | 0.996         | 0.987        | 0.058        | 0.016 |
| Czechia                         | 0.675            | 0.988         | 0.963        | 0.060        | 0.017 |
| Denmark                         | 0.741            | 0.991         | 0.972        | 0.068        | 0.019 |
| Estonia                         | 0.763            | 0.989         | 0.967        | 0.077        | 0.019 |
| Finland                         | 0.685            | 0.920         | <b>0.761</b> | <b>0.169</b> | 0.056 |
| France                          | 0.733            | 0.996         | 0.988        | 0.037        | 0.013 |
| Hungary                         | 0.766            | 0.997         | 0.990        | 0.044        | 0.011 |
| Iceland                         | 0.858            | 1.000         | 1.001        | 0.000        | 0.004 |
| Israel                          | 0.796            | 0.998         | 0.994        | 0.035        | 0.010 |
| Italy                           | 0.743            | 0.989         | 0.968        | 0.072        | 0.019 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Japan                           | 0.824                           | 0.989         | 0.967 | <b>0.124</b> | 0.027 |
| Kazakhstan                      | 0.797                           | 0.995         | 0.984 | 0.054        | 0.013 |
| Korea                           | 0.833                           | 0.997         | 0.990 | 0.074        | 0.016 |
| Kosovo                          | 0.804                           | 0.988         | 0.963 | 0.096        | 0.020 |
| Latvia                          | 0.755                           | 0.990         | 0.971 | 0.065        | 0.018 |
| Lithuania                       | 0.762                           | 0.978         | 0.934 | <b>0.101</b> | 0.024 |
| Malta                           | 0.747                           | 0.996         | 0.987 | 0.059        | 0.015 |
| Montenegro                      | 0.842                           | 0.999         | 0.996 | 0.040        | 0.008 |
| Morocco                         | 0.820                           | 0.985         | 0.955 | 0.067        | 0.021 |
| Netherlands                     | 0.716                           | 0.998         | 0.993 | 0.024        | 0.015 |
| New Zealand                     | 0.732                           | 0.987         | 0.960 | 0.077        | 0.025 |
| North Macedonia                 | 0.830                           | 0.997         | 0.990 | 0.058        | 0.010 |
| Norway                          | <b>0.599</b>                    | 0.993         | 0.980 | 0.036        | 0.018 |
| Poland                          | 0.768                           | 0.993         | 0.978 | 0.059        | 0.021 |
| Portugal                        | 0.807                           | 0.990         | 0.969 | 0.092        | 0.024 |
| Romania                         | 0.781                           | 0.996         | 0.988 | 0.048        | 0.012 |
| Saudi Arabia                    | 0.839                           | 0.986         | 0.959 | <b>0.126</b> | 0.026 |
| Serbia                          | 0.829                           | 0.998         | 0.994 | 0.044        | 0.009 |
| Shanghai (China)                | 0.803                           | 0.990         | 0.969 | <b>0.132</b> | 0.029 |
| Singapore                       | 0.789                           | 0.979         | 0.938 | <b>0.120</b> | 0.029 |
| Slovak Republic                 | 0.764                           | 0.988         | 0.963 | 0.085        | 0.023 |
| Slovenia                        | 0.728                           | 0.990         | 0.971 | 0.064        | 0.020 |
| South Africa                    | 0.869                           | 1.000         | 1.001 | 0.000        | 0.003 |
| Spain                           | 0.761                           | 0.994         | 0.981 | 0.044        | 0.016 |
| Sweden                          | 0.673                           | 0.970         | 0.910 | 0.084        | 0.031 |
| Türkiye                         | 0.810                           | 0.998         | 0.995 | 0.042        | 0.009 |
| United Arab Emirates            | 0.829                           | 0.980         | 0.939 | 0.093        | 0.024 |
| United States                   | 0.775                           | 0.986         | 0.958 | 0.073        | 0.024 |
| Uzbekistan                      | 0.877                           | 0.999         | 0.998 | 0.037        | 0.005 |
| Viet Nam                        | 0.867                           | 0.996         | 0.989 | 0.092        | 0.013 |
| International pooled data       | 0.802                           | 0.995         | 0.986 | 0.057        | 0.014 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.765                           | 0.999         | 0.998 | 0.022        | 0.009 |
| Belgium                         | 0.750                           | 0.999         | 0.996 | 0.023        | 0.010 |
| Flemish Community (Belgium)     | 0.718                           | 1.000         | 1.001 | 0.000        | 0.007 |
| French Community (Belgium)      | 0.766                           | 0.997         | 0.992 | 0.029        | 0.013 |
| Brazil                          | 0.820                           | 1.000         | 1.002 | 0.000        | 0.002 |
| France                          | 0.645                           | 0.999         | 0.997 | 0.012        | 0.018 |
| Japan                           | 0.816                           | 0.994         | 0.982 | 0.077        | 0.018 |
| Korea                           | 0.791                           | 0.990         | 0.971 | <b>0.101</b> | 0.026 |
| Morocco                         | 0.765                           | 0.995         | 0.986 | 0.040        | 0.016 |



| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Netherlands                     | 0.778                           | 1.000         | 1.013 | 0.000        | 0.006 |
| New Zealand                     | 0.733                           | 1.000         | 1.007 | 0.000        | 0.004 |
| Saudi Arabia                    | 0.838                           | 0.986         | 0.957 | <b>0.128</b> | 0.031 |
| Slovenia                        | 0.715                           | 1.000         | 1.002 | 0.000        | 0.004 |
| Spain                           | 0.779                           | 0.990         | 0.970 | 0.059        | 0.020 |
| Türkiye                         | 0.812                           | 0.999         | 0.998 | 0.027        | 0.008 |
| United Arab Emirates            | 0.789                           | 0.994         | 0.981 | 0.061        | 0.017 |
| International pooled data       | 0.838                           | 0.999         | 0.997 | 0.035        | 0.008 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.800                           | 0.993         | 0.978 | 0.077        | 0.016 |
| Denmark                         | 0.681                           | 0.997         | 0.990 | 0.032        | 0.013 |
| Flemish Community (Belgium)     | 0.669                           | 0.979         | 0.938 | 0.073        | 0.025 |
| Portugal                        | 0.806                           | 0.992         | 0.976 | 0.082        | 0.020 |
| Saudi Arabia                    | 0.836                           | 0.978         | 0.935 | <b>0.158</b> | 0.031 |
| Slovenia                        | 0.765                           | 0.994         | 0.983 | 0.055        | 0.015 |
| Türkiye                         | 0.819                           | 0.999         | 0.998 | 0.030        | 0.006 |
| United Arab Emirates            | 0.813                           | 0.990         | 0.970 | 0.066        | 0.021 |
| International pooled data       | 0.822                           | 0.998         | 0.993 | 0.046        | 0.011 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.98. Measurement invariance results from MGCFA for scale T4DRTWCI with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.992     | 0.977 | 0.077 | 0.018 | -                       | -      | -       | -      |
| Equal loadings                | 0.980     | 0.976 | 0.079 | 0.034 | -0.012                  | -0.001 | 0.002   | 0.016  |
| Equal loadings and thresholds | 0.839     | 0.918 | 0.146 | 0.147 | -0.141                  | -0.058 | 0.067   | 0.114  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.99. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4DRTWCI**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G52A | 0.593   | -1.544      | -0.395      | 0.799       |
| TT4G52E | 0.717   | -0.291      | 0.611       | 1.461       |
| TT4G52G | 0.855   | -1.023      | 0.126       | 1.209       |
| TT4G52K | 0.702   | -0.399      | 0.735       | 1.630       |

Source: OECD, TALIS 2024 database.

### Use of digital resources and tools for individualised instruction and assessment (T4DRTIIA)

Teachers answered four items targeting their *Use of digital resources and tools for individualised instruction and assessment* (T4DRTIIA). These items were TT4G52C, TT4G52H, TT4G52I and TT4G52J. Each item (described in Table 11.100) had four response categories: “Never or almost never”, “Occasionally”, “Frequently” and “Always”. Higher values on this scale indicate a higher use of digital resources and tools for individualised instruction and assessment.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.101. The scale T4DRTIIA has high reliability (above 0.700) in all populations. In terms of model fit, the CFI and SRMR are both acceptable in all populations. The TLI is acceptable for most participants, except for Hungary (ISCED level 2). The RMSEA is also acceptable for most participants, except for the ISCED levels 1 and 2 populations in Australia, and the ISCED level 2 population in Belgium, Bulgaria, Croatia, Finland, Hungary, Malta, Montenegro, New Zealand, Norway, Singapore and the Slovak Republic.

Table 11.102 presents the results from the measurement invariance testing for T4DRTIIA for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is close to the acceptable range for the TLI and RMSEA and exceeds the cut-off criteria for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.103 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4DRTIIA. All items show high loadings. Results by participating country/territory show a low item loading for item TT4G52C in Serbia (ISCED level 2) and France (ISCED level 1).

**Table 11.100. Items and response categories used in the construction of scale T4DRTIIA**

| Scale or item | Question or item wording                                                                                                                                                                                                                    |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4DRTIIA      | Thinking about your lessons in the <target class>, how often do you perform the following tasks?<br><i>Recoded response categories for scaling: 1=Never or almost never; 2=Occasionally; 3=Frequently; 4=Always</i><br>Scale mid-point: 2.5 |
| TT4G52C       | Provide digital feedback on student work                                                                                                                                                                                                    |
| TT4G52H       | Use <digital resources and tools> that provide personalised learning paths for students                                                                                                                                                     |
| TT4G52I       | Use <digital resources and tools> to assess student learning                                                                                                                                                                                |
| TT4G52J       | Provide <digital resources and tools> that allow students to plan and monitor their own learning                                                                                                                                            |

Source: OECD, TALIS 2024 database.

**Table 11.101. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4DRTIIA**

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                                 |               |       |              |       |
| Albania                         | 0.840                           | 0.997         | 0.991 | 0.061        | 0.011 |
| Alberta (Canada)                | 0.882                           | 0.998         | 0.994 | 0.044        | 0.007 |
| Australia                       | 0.822                           | 0.988         | 0.964 | <b>0.123</b> | 0.021 |
| Austria                         | 0.846                           | 0.993         | 0.979 | 0.090        | 0.016 |
| Azerbaijan                      | 0.911                           | 1.000         | 0.999 | 0.039        | 0.004 |
| Bahrain                         | 0.899                           | 0.999         | 0.997 | 0.063        | 0.008 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Belgium                         | 0.828                           | 0.986         | 0.958        | <b>0.101</b> | 0.018 |
| Flemish Community (Belgium)     | 0.799                           | 0.992         | 0.975        | 0.078        | 0.015 |
| French Community (Belgium)      | 0.807                           | 0.997         | 0.991        | 0.041        | 0.010 |
| Brazil                          | 0.896                           | 0.998         | 0.993        | 0.077        | 0.010 |
| Bulgaria                        | 0.818                           | 0.991         | 0.973        | 0.100        | 0.018 |
| Chile                           | 0.890                           | 0.998         | 0.994        | 0.058        | 0.011 |
| Colombia                        | 0.896                           | 0.999         | 0.997        | 0.042        | 0.007 |
| Costa Rica                      | 0.863                           | 0.999         | 0.996        | 0.044        | 0.007 |
| Croatia                         | 0.846                           | 0.990         | 0.971        | <b>0.107</b> | 0.018 |
| Cyprus                          | 0.886                           | 1.000         | 1.000        | 0.012        | 0.004 |
| Czechia                         | 0.801                           | 1.000         | 0.999        | 0.017        | 0.004 |
| Denmark                         | 0.836                           | 0.998         | 0.994        | 0.050        | 0.010 |
| Estonia                         | 0.789                           | 0.990         | 0.969        | 0.096        | 0.019 |
| Finland                         | 0.769                           | 0.970         | 0.909        | <b>0.133</b> | 0.030 |
| France                          | 0.774                           | 1.000         | 1.002        | 0.000        | 0.004 |
| Hungary                         | 0.820                           | 0.965         | <b>0.894</b> | <b>0.218</b> | 0.037 |
| Iceland                         | 0.821                           | 0.998         | 0.993        | 0.054        | 0.011 |
| Israel                          | 0.880                           | 0.998         | 0.995        | 0.061        | 0.010 |
| Italy                           | 0.824                           | 0.999         | 0.996        | 0.038        | 0.007 |
| Japan                           | 0.874                           | 1.000         | 1.000        | 0.018        | 0.004 |
| Kazakhstan                      | 0.864                           | 1.000         | 1.000        | 0.013        | 0.003 |
| Korea                           | 0.928                           | 0.999         | 0.998        | 0.061        | 0.006 |
| Kosovo                          | 0.907                           | 1.000         | 0.999        | 0.024        | 0.004 |
| Latvia                          | 0.821                           | 0.995         | 0.985        | 0.070        | 0.014 |
| Lithuania                       | 0.864                           | 0.996         | 0.988        | 0.075        | 0.011 |
| Malta                           | 0.868                           | 0.996         | 0.987        | <b>0.101</b> | 0.014 |
| Montenegro                      | 0.848                           | 0.991         | 0.974        | <b>0.140</b> | 0.019 |
| Morocco                         | 0.904                           | 1.000         | 0.999        | 0.016        | 0.004 |
| Netherlands                     | 0.794                           | 0.999         | 0.997        | 0.021        | 0.009 |
| New Zealand                     | 0.831                           | 0.989         | 0.968        | <b>0.109</b> | 0.020 |
| North Macedonia                 | 0.905                           | 1.000         | 1.000        | 0.023        | 0.003 |
| Norway                          | 0.770                           | 0.970         | 0.911        | <b>0.134</b> | 0.031 |
| Poland                          | 0.802                           | 0.990         | 0.969        | 0.082        | 0.020 |
| Portugal                        | 0.823                           | 0.999         | 0.996        | 0.043        | 0.008 |
| Romania                         | 0.889                           | 0.999         | 0.998        | 0.036        | 0.005 |
| Saudi Arabia                    | 0.929                           | 1.000         | 1.000        | 0.000        | 0.002 |
| Serbia                          | 0.789                           | 0.994         | 0.983        | 0.086        | 0.020 |
| Shanghai (China)                | 0.927                           | 0.999         | 0.997        | 0.088        | 0.007 |
| Singapore                       | 0.888                           | 0.992         | 0.976        | <b>0.132</b> | 0.019 |
| Slovak Republic                 | 0.797                           | 0.982         | 0.947        | <b>0.132</b> | 0.026 |
| Slovenia                        | 0.803                           | 0.997         | 0.992        | 0.047        | 0.011 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| South Africa                    | 0.930                           | 1.000         | 0.999 | 0.040        | 0.005 |
| Spain                           | 0.839                           | 0.999         | 0.997 | 0.030        | 0.007 |
| Sweden                          | 0.799                           | 1.000         | 1.000 | 0.000        | 0.004 |
| Türkiye                         | 0.905                           | 1.000         | 1.000 | 0.000        | 0.002 |
| United Arab Emirates            | 0.912                           | 1.000         | 1.001 | 0.000        | 0.001 |
| United States                   | 0.852                           | 0.995         | 0.984 | 0.071        | 0.014 |
| Uzbekistan                      | 0.896                           | 1.000         | 0.999 | 0.027        | 0.004 |
| Viet Nam                        | 0.918                           | 1.000         | 1.000 | 0.030        | 0.004 |
| International pooled data       | 0.875                           | 0.999         | 0.997 | 0.044        | 0.006 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.859                           | 0.993         | 0.978 | <b>0.106</b> | 0.017 |
| Belgium                         | 0.804                           | 0.994         | 0.983 | 0.056        | 0.014 |
| Flemish Community (Belgium)     | 0.744                           | 0.985         | 0.954 | 0.081        | 0.021 |
| French Community (Belgium)      | 0.840                           | 1.000         | 1.003 | 0.000        | 0.002 |
| Brazil                          | 0.864                           | 0.999         | 0.996 | 0.040        | 0.008 |
| France                          | 0.744                           | 1.000         | 1.004 | 0.000        | 0.003 |
| Japan                           | 0.863                           | 1.000         | 0.999 | 0.025        | 0.005 |
| Korea                           | 0.929                           | 1.000         | 0.999 | 0.033        | 0.003 |
| Morocco                         | 0.888                           | 0.999         | 0.998 | 0.025        | 0.006 |
| Netherlands                     | 0.777                           | 1.000         | 1.006 | 0.000        | 0.013 |
| New Zealand                     | 0.843                           | 0.998         | 0.994 | 0.054        | 0.010 |
| Saudi Arabia                    | 0.922                           | 1.000         | 0.999 | 0.038        | 0.005 |
| Slovenia                        | 0.844                           | 1.000         | 1.000 | 0.006        | 0.004 |
| Spain                           | 0.846                           | 1.000         | 1.000 | 0.010        | 0.004 |
| Türkiye                         | 0.898                           | 0.999         | 0.997 | 0.054        | 0.007 |
| United Arab Emirates            | 0.884                           | 1.000         | 1.001 | 0.000        | 0.001 |
| International pooled data       | 0.896                           | 1.000         | 0.999 | 0.034        | 0.004 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.842                           | 0.997         | 0.991 | 0.068        | 0.011 |
| Denmark                         | 0.769                           | 0.989         | 0.966 | 0.086        | 0.022 |
| Flemish Community (Belgium)     | 0.791                           | 0.999         | 0.997 | 0.028        | 0.008 |
| Portugal                        | 0.832                           | 0.995         | 0.984 | 0.084        | 0.014 |
| Saudi Arabia                    | 0.931                           | 1.000         | 0.999 | 0.041        | 0.004 |
| Slovenia                        | 0.846                           | 0.999         | 0.998 | 0.034        | 0.007 |
| Türkiye                         | 0.911                           | 0.999         | 0.997 | 0.062        | 0.007 |
| United Arab Emirates            | 0.901                           | 1.000         | 1.000 | 0.000        | 0.003 |
| International pooled data       | 0.885                           | 0.999         | 0.998 | 0.041        | 0.006 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.102. Measurement invariance results from MGCFA for scale T4DRTIIA with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.997     | 0.992 | 0.076 | 0.011 | -                       | -      | -       | -      |
| Equal loadings                | 0.993     | 0.992 | 0.075 | 0.022 | -0.004                  | 0.000  | -0.001  | 0.011  |
| Equal loadings and thresholds | 0.967     | 0.983 | 0.108 | 0.102 | -0.026                  | -0.009 | 0.033   | 0.080  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.103. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4DRTIIA**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G52C | 0.704   | -0.784      | 0.304       | 1.241       |
| TT4G52H | 0.829   | -0.873      | 0.249       | 1.321       |
| TT4G52I | 0.803   | -0.968      | 0.074       | 1.077       |
| TT4G52J | 0.873   | -0.644      | 0.371       | 1.315       |

Source: OECD, TALIS 2024 database.

### Perceived classroom disruption (T4CLSDIS)

The scale of *Perceived classroom disruption* (T4CLSDIS) was measured by a set of four items (TT4G54A, TT4G54B, TT4G54C and TT4G54D), described in Table 11.104. For each of these items, teachers had to indicate the extent to which certain situations occur in the target class, using the following response categories: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher scores on this scale reflect greater perceived classroom disruption.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.105. The reliabilities for T4CLSDIS are high (above 0.800) in all populations. As can be observed from Table 11.105, the CFI, TLI and SRMR for T4CLSDIS are all within the acceptable cut-off criteria for all populations. However, the RMSEA exceeds the cut-off criterion in 18 of the ISCED level 2 participants, particularly in Iceland, where it is greater than 0.200. It also exceeds the cut-off in the ISCED level 1 population in Belgium, the Flemish Community of Belgium, Korea and Türkiye, and the ISCED level 3 population in Croatia, the Flemish Community of Belgium and Türkiye.

Table 11.106 presents the results from the measurement invariance testing for T4CLSDIS for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criteria for all indices but for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.107 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4SECLS. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.104. Items and response categories used in the construction of scale T4SECLS**

| Scale or item | Question or item wording                                                                               |
|---------------|--------------------------------------------------------------------------------------------------------|
| T4CLSDIS      | To what extent do these situations happen in the <target class>?                                       |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i> |
|               | Scale mid-point: 2.5                                                                                   |
| TT4G54A       | There is much disruptive noise and disorder.                                                           |
| TT4G54B       | I have to wait a long time for students to quiet down.                                                 |
| TT4G54C       | Many students don't start working for a long time after the lesson begins.                             |
| TT4G54D       | I lose quite a lot of time because students interrupt the lesson.                                      |

Source: OECD, TALIS 2024 database.

**Table 11.105. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4CLSDIS**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.911            | 0.994         | 0.981 | 0.095        | 0.022 |
| Alberta (Canada)                | 0.949            | 0.999         | 0.996 | 0.082        | 0.012 |
| Australia                       | 0.961            | 0.999         | 0.998 | 0.095        | 0.008 |
| Austria                         | 0.955            | 0.999         | 0.996 | <b>0.112</b> | 0.010 |
| Azerbaijan                      | 0.892            | 1.000         | 1.000 | 0.000        | 0.002 |
| Bahrain                         | 0.922            | 0.994         | 0.983 | <b>0.132</b> | 0.015 |
| Belgium                         | 0.950            | 0.998         | 0.995 | <b>0.109</b> | 0.010 |
| Flemish Community (Belgium)     | 0.959            | 0.999         | 0.998 | 0.078        | 0.006 |
| French Community (Belgium)      | 0.938            | 0.997         | 0.992 | <b>0.119</b> | 0.014 |
| Brazil                          | 0.941            | 0.998         | 0.993 | <b>0.116</b> | 0.012 |
| Bulgaria                        | 0.942            | 0.998         | 0.994 | 0.082        | 0.013 |
| Chile                           | 0.956            | 0.998         | 0.994 | <b>0.108</b> | 0.013 |
| Colombia                        | 0.935            | 0.999         | 0.998 | 0.042        | 0.008 |
| Costa Rica                      | 0.932            | 0.996         | 0.988 | <b>0.119</b> | 0.014 |
| Croatia                         | 0.950            | 0.998         | 0.995 | 0.100        | 0.014 |
| Cyprus                          | 0.943            | 0.999         | 0.996 | 0.086        | 0.011 |
| Czechia                         | 0.939            | 0.999         | 0.996 | 0.074        | 0.011 |
| Denmark                         | 0.938            | 0.999         | 0.996 | 0.095        | 0.010 |
| Estonia                         | 0.955            | 0.999         | 0.997 | 0.085        | 0.010 |
| Finland                         | 0.947            | 0.999         | 0.996 | <b>0.103</b> | 0.010 |
| France                          | 0.936            | 0.999         | 0.997 | 0.072        | 0.011 |
| Hungary                         | 0.950            | 0.997         | 0.992 | <b>0.141</b> | 0.015 |
| Iceland                         | 0.955            | 0.997         | 0.991 | <b>0.209</b> | 0.017 |
| Israel                          | 0.960            | 0.999         | 0.997 | 0.087        | 0.007 |
| Italy                           | 0.951            | 0.999         | 0.997 | 0.088        | 0.008 |
| Japan                           | 0.960            | 0.999         | 0.998 | 0.065        | 0.008 |
| Kazakhstan                      | 0.929            | 0.995         | 0.985 | 0.096        | 0.016 |
| Korea                           | 0.954            | 0.998         | 0.995 | <b>0.117</b> | 0.010 |

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| Kosovo                          | 0.934            | 0.997         | 0.991 | 0.088        | 0.012 |
| Latvia                          | 0.948            | 0.999         | 0.997 | 0.069        | 0.009 |
| Lithuania                       | 0.957            | 0.999         | 0.997 | 0.075        | 0.009 |
| Malta                           | 0.961            | 0.999         | 0.997 | <b>0.116</b> | 0.010 |
| Montenegro                      | 0.952            | 1.000         | 0.999 | 0.031        | 0.004 |
| Morocco                         | 0.915            | 0.995         | 0.986 | 0.075        | 0.014 |
| Netherlands                     | 0.946            | 0.998         | 0.995 | 0.099        | 0.013 |
| New Zealand                     | 0.964            | 0.999         | 0.997 | 0.098        | 0.009 |
| North Macedonia                 | 0.941            | 0.999         | 0.996 | 0.061        | 0.009 |
| Norway                          | 0.959            | 1.000         | 1.000 | 0.034        | 0.005 |
| Poland                          | 0.951            | 0.998         | 0.993 | <b>0.115</b> | 0.017 |
| Portugal                        | 0.947            | 0.997         | 0.991 | <b>0.144</b> | 0.013 |
| Romania                         | 0.953            | 0.999         | 0.997 | 0.072        | 0.007 |
| Saudi Arabia                    | 0.934            | 1.000         | 1.000 | 0.007        | 0.003 |
| Serbia                          | 0.945            | 0.996         | 0.988 | <b>0.142</b> | 0.018 |
| Shanghai (China)                | 0.962            | 1.000         | 0.999 | 0.051        | 0.006 |
| Singapore                       | 0.957            | 0.999         | 0.997 | <b>0.101</b> | 0.009 |
| Slovak Republic                 | 0.959            | 0.999         | 0.997 | 0.086        | 0.008 |
| Slovenia                        | 0.944            | 0.998         | 0.994 | 0.100        | 0.011 |
| South Africa                    | 0.932            | 1.000         | 1.000 | 0.000        | 0.003 |
| Spain                           | 0.958            | 0.999         | 0.997 | 0.078        | 0.006 |
| Sweden                          | 0.951            | 0.998         | 0.994 | <b>0.130</b> | 0.012 |
| Türkiye                         | 0.946            | 0.999         | 0.996 | 0.094        | 0.009 |
| United Arab Emirates            | 0.929            | 0.998         | 0.994 | 0.065        | 0.014 |
| United States                   | 0.944            | 1.000         | 0.999 | 0.038        | 0.006 |
| Uzbekistan                      | 0.896            | 0.999         | 0.996 | 0.052        | 0.008 |
| Viet Nam                        | 0.940            | 0.995         | 0.985 | <b>0.177</b> | 0.018 |
| International pooled data       | 0.949            | 0.999         | 0.996 | 0.083        | 0.008 |
| <b>ISCED level 1</b>            |                  |               |       |              |       |
| Australia                       | 0.954            | 1.000         | 0.999 | 0.063        | 0.006 |
| Belgium                         | 0.933            | 0.997         | 0.992 | <b>0.119</b> | 0.015 |
| Flemish Community (Belgium)     | 0.938            | 0.997         | 0.991 | <b>0.146</b> | 0.016 |
| French Community (Belgium)      | 0.930            | 0.998         | 0.995 | 0.081        | 0.011 |
| Brazil                          | 0.922            | 0.999         | 0.997 | 0.058        | 0.007 |
| France                          | 0.933            | 0.999         | 0.998 | 0.047        | 0.008 |
| Japan                           | 0.955            | 0.999         | 0.997 | 0.076        | 0.008 |
| Korea                           | 0.950            | 0.998         | 0.995 | <b>0.104</b> | 0.011 |
| Morocco                         | 0.888            | 0.995         | 0.984 | 0.074        | 0.016 |
| Netherlands                     | 0.921            | 0.999         | 0.998 | 0.043        | 0.010 |
| New Zealand                     | 0.944            | 0.999         | 0.998 | 0.054        | 0.008 |
| Saudi Arabia                    | 0.913            | 1.000         | 0.999 | 0.025        | 0.004 |
| Slovenia                        | 0.945            | 0.999         | 0.998 | 0.072        | 0.008 |

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| Spain                           | 0.951            | 0.999         | 0.998 | 0.053        | 0.006 |
| Türkiye                         | 0.939            | 0.996         | 0.989 | <b>0.126</b> | 0.015 |
| United Arab Emirates            | 0.901            | 0.998         | 0.995 | 0.049        | 0.008 |
| International pooled data       | 0.936            | 0.999         | 0.997 | 0.060        | 0.007 |
| <b>ISCED level 3</b>            |                  |               |       |              |       |
| Croatia                         | 0.956            | 0.998         | 0.995 | <b>0.101</b> | 0.012 |
| Denmark                         | 0.942            | 0.999         | 0.997 | 0.070        | 0.011 |
| Flemish Community (Belgium)     | 0.959            | 0.999         | 0.996 | <b>0.119</b> | 0.010 |
| Portugal                        | 0.951            | 0.999         | 0.997 | 0.088        | 0.009 |
| Saudi Arabia                    | 0.919            | 0.999         | 0.996 | 0.050        | 0.008 |
| Slovenia                        | 0.946            | 0.999         | 0.997 | 0.067        | 0.008 |
| Türkiye                         | 0.942            | 0.997         | 0.992 | <b>0.116</b> | 0.012 |
| United Arab Emirates            | 0.940            | 0.998         | 0.993 | 0.076        | 0.011 |
| International pooled data       | 0.949            | 0.999         | 0.996 | 0.082        | 0.009 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.106. Measurement invariance results from MGCFA for scale T4CLSDIS with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.998     | 0.995 | 0.095 | 0.011 | -                       | -      | -       | -      |
| Equal loadings                | 0.998     | 0.997 | 0.074 | 0.017 | -0.001                  | 0.002  | -0.021  | 0.006  |
| Equal loadings and thresholds | 0.994     | 0.997 | 0.075 | 0.070 | -0.004                  | -0.000 | 0.001   | 0.053  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.107. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4CLSDIS**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G54A | 0.902   | -0.374      | 0.888       | 1.706       |
| TT4G54B | 0.934   | -0.027      | 1.099       | 1.845       |
| TT4G54C | 0.863   | -0.077      | 1.069       | 1.857       |
| TT4G54D | 0.930   | 0.001       | 1.031       | 1.735       |

Source: OECD, TALIS 2024 database.

### Adaptive learning (T4ADLE)

In TQ-55, teachers were asked to indicate how frequently they performed different actions related to adapting their teaching to the needs of their students. For each action, they selected from the following response options: “Never or almost never”, “Occasionally”, “Frequently” or “Always”. Responses to the



five items (TT4G55A, TT4G55B, TT4G55C, TT4G55D, TT4G55E) in this question were used to derive a scale reflecting teachers' *Adaptive learning* (T4ADLE) practices. Higher values on these scales indicate a higher frequency of such practices. Table 11.108 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.109, except for Slovenia (all ISCED levels), where not all items in the scale were administered. Therefore, no scale results or scores are provided for any ISCED level in Slovenia. The scale T4ADLE has high reliability (above 0.700) in all populations. As can be observed from Table 11.109, the CFI, TLI and SRMR for T4ADLE are all within the acceptable cut-off criteria for all participants. However, the RMSEA is above the cut-off in 12 ISCED level 2 participants (Brazil, Costa Rica, Croatia, Estonia, Iceland, Japan, Korea, Malta, Montenegro, North Macedonia, Saudi Arabia and Viet Nam), 6 ISCED level 1 participants (Japan, Korea, New Zealand, Saudi Arabia, Türkiye and the United Arab Emirates), and the ISCED level 3 population in Croatia and Saudi Arabia.

Table 11.110 presents the results from the measurement invariance testing for T4ADLE for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is close to the cut-off criteria for the TLI and RMSEA and exceeds the acceptable range for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.111 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4ADLE. All items show high loadings. Results by participating country/territory indicate low loadings for item TT4G55A in the Netherlands (ISCED level 2) and for item TT4G55B in Denmark (ISCED level 3).

**Table 11.108. Items and response categories used in the construction of scale T4ADLE**

| Scale or item | Question or item wording                                                                                                                                                                                                                       |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4ADLE        | Thinking about your teaching in the <target class>, how often do you perform the following actions?<br><i>Recoded response categories for scaling: 1=Never or almost never; 2=Occasionally; 3=Frequently; 4=Always</i><br>Scale mid-point: 2.5 |
| TT4G55A       | I consider students' prior knowledge and needs when planning a lesson.                                                                                                                                                                         |
| TT4G55B       | I point students to different materials for learning depending on their needs.                                                                                                                                                                 |
| TT4G55C       | I change my way of explaining when a student has difficulties understanding a topic or task.                                                                                                                                                   |
| TT4G55D       | I adapt my teaching methods to students' needs.                                                                                                                                                                                                |
| TT4G55E       | I ask questions at various difficulty levels to check students' understanding of the subject matter.                                                                                                                                           |

**Table 11.109. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4ADLE**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 2                   |                  |               |       |       |       |
| Albania                         | 0.881            | 0.986         | 0.973 | 0.086 | 0.026 |
| Alberta (Canada)                | 0.880            | 0.995         | 0.990 | 0.054 | 0.020 |
| Australia                       | 0.897            | 0.994         | 0.988 | 0.078 | 0.020 |
| Austria                         | 0.810            | 0.988         | 0.976 | 0.065 | 0.021 |
| Azerbaijan                      | 0.852            | 0.987         | 0.974 | 0.080 | 0.022 |
| Bahrain                         | 0.925            | 0.993         | 0.986 | 0.095 | 0.020 |
| Belgium                         | 0.805            | 0.987         | 0.974 | 0.064 | 0.022 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Flemish Community (Belgium)     | 0.806                           | 0.991         | 0.982 | 0.055        | 0.020 |
| French Community (Belgium)      | 0.807                           | 0.985         | 0.970 | 0.070        | 0.023 |
| Brazil                          | 0.897                           | 0.983         | 0.965 | <b>0.129</b> | 0.035 |
| Bulgaria                        | 0.881                           | 0.988         | 0.976 | 0.092        | 0.026 |
| Chile                           | 0.887                           | 0.988         | 0.976 | 0.077        | 0.028 |
| Colombia                        | 0.913                           | 0.993         | 0.986 | 0.077        | 0.019 |
| Costa Rica                      | 0.909                           | 0.964         | 0.928 | <b>0.168</b> | 0.039 |
| Croatia                         | 0.895                           | 0.988         | 0.977 | <b>0.104</b> | 0.028 |
| Cyprus                          | 0.884                           | 0.990         | 0.979 | 0.097        | 0.028 |
| Czechia                         | 0.847                           | 0.988         | 0.977 | 0.078        | 0.024 |
| Denmark                         | 0.778                           | 0.983         | 0.965 | 0.068        | 0.028 |
| Estonia                         | 0.884                           | 0.985         | 0.969 | <b>0.116</b> | 0.026 |
| Finland                         | 0.860                           | 0.994         | 0.988 | 0.062        | 0.017 |
| France                          | 0.803                           | 0.991         | 0.982 | 0.056        | 0.020 |
| Hungary                         | 0.827                           | 0.989         | 0.979 | 0.062        | 0.021 |
| Iceland                         | 0.834                           | 0.982         | 0.964 | <b>0.106</b> | 0.027 |
| Israel                          | 0.887                           | 0.994         | 0.988 | 0.073        | 0.019 |
| Italy                           | 0.869                           | 0.991         | 0.981 | 0.074        | 0.021 |
| Japan                           | 0.873                           | 0.990         | 0.979 | <b>0.111</b> | 0.026 |
| Kazakhstan                      | 0.876                           | 0.994         | 0.989 | 0.050        | 0.014 |
| Korea                           | 0.848                           | 0.970         | 0.941 | <b>0.137</b> | 0.032 |
| Kosovo                          | 0.879                           | 0.986         | 0.973 | 0.086        | 0.024 |
| Latvia                          | 0.875                           | 0.986         | 0.973 | 0.090        | 0.028 |
| Lithuania                       | 0.892                           | 0.994         | 0.987 | 0.062        | 0.017 |
| Malta                           | 0.887                           | 0.987         | 0.973 | <b>0.116</b> | 0.029 |
| Montenegro                      | 0.925                           | 0.995         | 0.989 | <b>0.111</b> | 0.018 |
| Morocco                         | 0.847                           | 0.983         | 0.966 | 0.063        | 0.028 |
| Netherlands                     | 0.729                           | 0.995         | 0.990 | 0.028        | 0.019 |
| New Zealand                     | 0.886                           | 0.992         | 0.984 | 0.081        | 0.027 |
| North Macedonia                 | 0.905                           | 0.989         | 0.979 | <b>0.112</b> | 0.024 |
| Norway                          | 0.824                           | 0.995         | 0.990 | 0.045        | 0.021 |
| Poland                          | 0.902                           | 0.994         | 0.987 | 0.062        | 0.020 |
| Portugal                        | 0.874                           | 0.994         | 0.987 | 0.066        | 0.022 |
| Romania                         | 0.907                           | 0.995         | 0.991 | 0.065        | 0.015 |
| Saudi Arabia                    | 0.934                           | 0.988         | 0.977 | <b>0.125</b> | 0.022 |
| Serbia                          | 0.912                           | 0.993         | 0.987 | 0.089        | 0.018 |
| Shanghai (China)                | 0.967                           | 0.999         | 0.998 | 0.084        | 0.008 |
| Singapore                       | 0.909                           | 0.996         | 0.991 | 0.069        | 0.016 |
| Slovak Republic                 | 0.830                           | 0.996         | 0.991 | 0.046        | 0.016 |
| Slovenia                        | -                               | -             | -     | -            | -     |
| South Africa                    | 0.881                           | 0.988         | 0.977 | 0.089        | 0.029 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Spain                           | 0.887                           | 0.991         | 0.983 | 0.067        | 0.022 |
| Sweden                          | 0.833                           | 0.997         | 0.993 | 0.042        | 0.018 |
| Türkiye                         | 0.921                           | 0.996         | 0.992 | 0.081        | 0.014 |
| United Arab Emirates            | 0.916                           | 0.991         | 0.982 | 0.082        | 0.025 |
| United States                   | 0.897                           | 0.999         | 0.997 | 0.024        | 0.012 |
| Uzbekistan                      | 0.895                           | 0.990         | 0.980 | 0.093        | 0.019 |
| Viet Nam                        | 0.891                           | 0.992         | 0.984 | <b>0.101</b> | 0.020 |
| International pooled data       | 0.878                           | 0.994         | 0.987 | 0.062        | 0.016 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.929                           | 0.998         | 0.996 | 0.066        | 0.014 |
| Belgium                         | 0.849                           | 0.992         | 0.985 | 0.060        | 0.018 |
| Flemish Community (Belgium)     | 0.866                           | 0.990         | 0.980 | 0.079        | 0.019 |
| French Community (Belgium)      | 0.831                           | 0.992         | 0.984 | 0.058        | 0.022 |
| Brazil                          | 0.904                           | 0.987         | 0.973 | 0.099        | 0.024 |
| France                          | 0.861                           | 0.991         | 0.982 | 0.069        | 0.024 |
| Japan                           | 0.873                           | 0.986         | 0.973 | <b>0.117</b> | 0.029 |
| Korea                           | 0.865                           | 0.975         | 0.950 | <b>0.137</b> | 0.035 |
| Morocco                         | 0.843                           | 0.971         | 0.941 | 0.091        | 0.034 |
| Netherlands                     | 0.862                           | 0.995         | 0.989 | 0.057        | 0.021 |
| New Zealand                     | 0.916                           | 0.993         | 0.986 | <b>0.104</b> | 0.023 |
| Saudi Arabia                    | 0.940                           | 0.990         | 0.980 | <b>0.124</b> | 0.019 |
| Slovenia                        | -                               | -             | -     | -            | -     |
| Spain                           | 0.915                           | 0.991         | 0.982 | 0.075        | 0.024 |
| Türkiye                         | 0.934                           | 0.993         | 0.986 | <b>0.109</b> | 0.017 |
| United Arab Emirates            | 0.914                           | 0.982         | 0.964 | <b>0.114</b> | 0.031 |
| International pooled data       | 0.884                           | 0.994         | 0.989 | 0.066        | 0.016 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.890                           | 0.987         | 0.973 | <b>0.114</b> | 0.024 |
| Denmark                         | 0.731                           | 0.982         | 0.963 | 0.057        | 0.026 |
| Flemish Community (Belgium)     | 0.776                           | 0.981         | 0.962 | 0.073        | 0.028 |
| Portugal                        | 0.875                           | 0.994         | 0.987 | 0.070        | 0.024 |
| Saudi Arabia                    | 0.942                           | 0.993         | 0.986 | <b>0.112</b> | 0.017 |
| Slovenia                        | -                               | -             | -     | -            | -     |
| Türkiye                         | 0.914                           | 0.996         | 0.991 | 0.082        | 0.015 |
| United Arab Emirates            | 0.915                           | 0.994         | 0.988 | 0.062        | 0.022 |
| International pooled data       | 0.873                           | 0.994         | 0.987 | 0.066        | 0.020 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand, Norway and Slovenia are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Slovenia are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) and Slovenia are excluded from the pooled ISCED level 3 model. Slovenia (ISCED levels 1, 2, and 3) was excluded from this scale because not all items that comprise the scale were administered.

Source: OECD, TALIS 2024 database.

**Table 11.110. Measurement invariance results from MGCFA for scale T4ADLE with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.993     | 0.985 | 0.084 | 0.022 | -                       | -      | -       | -      |
| Equal loadings                | 0.991     | 0.990 | 0.071 | 0.030 | -0.002                  | 0.004  | -0.013  | 0.008  |
| Equal loadings and thresholds | 0.961     | 0.978 | 0.102 | 0.131 | -0.029                  | -0.011 | 0.032   | 0.101  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand, Norway and Slovenia are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.111. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4ADLE**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G55A | 0.732   | -2.368      | -1.282      | 0.110       |
| TT4G55B | 0.699   | -1.699      | -0.563      | 0.665       |
| TT4G55C | 0.806   | -2.611      | -1.312      | 0.024       |
| TT4G55D | 0.878   | -2.493      | -1.293      | 0.097       |
| TT4G55E | 0.780   | -2.213      | -1.132      | 0.192       |

Source: OECD, TALIS 2024 database.

### Progression-based learning (T4PBLE)

The scale of *Progression-based learning* (T4PBLE) was measured by a set of four items (TT4G56A, TT4G56B, TT4G56C, TT4G56D), described in Table 11.112. For each of these items, teachers had to indicate the frequency with which they performed different actions in their teaching of the target class, using the following response categories: “Never or almost never”, “Occasionally”, “Frequently” and “Always”. Higher scores on this scale reflect a higher frequency of progression-based learning practices.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.113. The reliabilities for T4PBLE are generally high and greater than 0.700 in all populations. As can be seen in Table 11.113, the CFI of T4PBLE is within the cut-off criterion for across populations. The TLI is also acceptable for almost all participants, except for the ISCED level 2 population in Estonia. The RMSEA exceeds the cut-off criterion in ten ISCED level 2 participants (Colombia, Estonia, Hungary, Iceland, Kosovo, Norway, Saudi Arabia, Singapore, Türkiye and the United Arab Emirates), as well as in both the ISCED levels 1 and 3 populations in Saudi Arabia. Model fit based on the SRMR is good for all populations.

Table 11.114 presents the results from the measurement invariance testing for T4PBLE for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA and SRMR and close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models is close to the cut-off criteria for the TLI and RMSEA and exceeds the acceptable range for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.115 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4PBLE. All items show high loadings for the pooled model as well as in single countries/territories.

Table 11.112. Items and response categories used in the construction of scale T4PBLE

| Scale or item | Question or item wording                                                                                        |
|---------------|-----------------------------------------------------------------------------------------------------------------|
| T4PBLE        | Thinking about your teaching in the <target class>, how often do you perform the following actions?             |
|               | <i>Recoded response categories for scaling: 1=Never or almost never; 2=Occasionally; 3=Frequently; 4=Always</i> |
|               | Scale mid-point: 2.5                                                                                            |
| TT4G56A       | I let students review multiple examples to practice the steps involved in a procedure or skill.                 |
| TT4G56B       | I select tasks for student practice that gradually increase in difficulty.                                      |
| TT4G56C       | I prepare students for difficulties that can occur while practicing a procedure or skill.                       |
| TT4G56D       | I let students practise similar tasks until I know that every student has understood the subject matter.        |

Source: OECD, TALIS 2024 database.

Table 11.113. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4PBLE

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |              |              |       |
| Albania                         | 0.860            | 0.995         | 0.986        | 0.076        | 0.014 |
| Alberta (Canada)                | 0.855            | 1.000         | 0.999        | 0.020        | 0.007 |
| Australia                       | 0.850            | 0.995         | 0.984        | 0.091        | 0.015 |
| Austria                         | 0.789            | 0.998         | 0.993        | 0.044        | 0.010 |
| Azerbaijan                      | 0.771            | 0.997         | 0.990        | 0.043        | 0.010 |
| Bahrain                         | 0.906            | 1.000         | 0.999        | 0.038        | 0.005 |
| Belgium                         | 0.833            | 0.999         | 0.997        | 0.035        | 0.007 |
| Flemish Community (Belgium)     | 0.831            | 0.999         | 0.997        | 0.032        | 0.007 |
| French Community (Belgium)      | 0.833            | 1.000         | 1.000        | 0.007        | 0.004 |
| Brazil                          | 0.888            | 0.996         | 0.989        | 0.085        | 0.013 |
| Bulgaria                        | 0.851            | 0.998         | 0.994        | 0.048        | 0.011 |
| Chile                           | 0.915            | 0.999         | 0.997        | 0.038        | 0.007 |
| Colombia                        | 0.874            | 0.989         | 0.967        | <b>0.128</b> | 0.023 |
| Costa Rica                      | 0.891            | 0.996         | 0.989        | 0.072        | 0.009 |
| Croatia                         | 0.842            | 0.994         | 0.982        | 0.081        | 0.015 |
| Cyprus                          | 0.849            | 0.993         | 0.980        | 0.095        | 0.018 |
| Czechia                         | 0.865            | 0.999         | 0.996        | 0.051        | 0.009 |
| Denmark                         | 0.716            | 0.999         | 0.996        | 0.021        | 0.008 |
| Estonia                         | 0.764            | 0.964         | <b>0.893</b> | <b>0.159</b> | 0.032 |
| Finland                         | 0.818            | 0.999         | 0.998        | 0.024        | 0.006 |
| France                          | 0.778            | 1.000         | 0.999        | 0.018        | 0.006 |
| Hungary                         | 0.874            | 0.993         | 0.978        | <b>0.107</b> | 0.016 |
| Iceland                         | 0.794            | 0.987         | 0.960        | <b>0.113</b> | 0.020 |
| Israel                          | 0.905            | 0.998         | 0.993        | 0.075        | 0.011 |
| Italy                           | 0.842            | 0.994         | 0.981        | 0.095        | 0.020 |
| Japan                           | 0.862            | 1.000         | 1.000        | 0.011        | 0.003 |
| Kazakhstan                      | 0.818            | 0.999         | 0.996        | 0.028        | 0.007 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Korea                           | 0.895                           | 0.999         | 0.997 | 0.054        | 0.007 |
| Kosovo                          | 0.842                           | 0.985         | 0.955 | <b>0.126</b> | 0.026 |
| Latvia                          | 0.847                           | 0.998         | 0.993 | 0.049        | 0.010 |
| Lithuania                       | 0.829                           | 0.998         | 0.993 | 0.039        | 0.008 |
| Malta                           | 0.863                           | 0.996         | 0.989 | 0.082        | 0.012 |
| Montenegro                      | 0.871                           | 0.998         | 0.995 | 0.065        | 0.011 |
| Morocco                         | 0.850                           | 0.994         | 0.982 | 0.064        | 0.015 |
| Netherlands                     | 0.790                           | 0.989         | 0.966 | 0.076        | 0.018 |
| New Zealand                     | 0.817                           | 0.991         | 0.972 | 0.089        | 0.018 |
| North Macedonia                 | 0.900                           | 1.000         | 0.999 | 0.031        | 0.005 |
| Norway                          | 0.838                           | 0.980         | 0.940 | <b>0.151</b> | 0.029 |
| Poland                          | 0.858                           | 0.997         | 0.992 | 0.045        | 0.011 |
| Portugal                        | 0.868                           | 0.998         | 0.995 | 0.048        | 0.009 |
| Romania                         | 0.872                           | 1.000         | 0.999 | 0.021        | 0.005 |
| Saudi Arabia                    | 0.918                           | 0.995         | 0.986 | <b>0.126</b> | 0.015 |
| Serbia                          | 0.891                           | 0.998         | 0.994 | 0.060        | 0.008 |
| Shanghai (China)                | 0.933                           | 0.999         | 0.997 | 0.093        | 0.008 |
| Singapore                       | 0.897                           | 0.996         | 0.987 | <b>0.102</b> | 0.013 |
| Slovak Republic                 | 0.833                           | 0.998         | 0.994 | 0.053        | 0.010 |
| Slovenia                        | 0.872                           | 1.000         | 1.001 | 0.000        | 0.002 |
| South Africa                    | 0.856                           | 0.999         | 0.996 | 0.037        | 0.008 |
| Spain                           | 0.870                           | 0.999         | 0.996 | 0.034        | 0.007 |
| Sweden                          | 0.795                           | 1.000         | 0.999 | 0.016        | 0.006 |
| Türkiye                         | 0.914                           | 0.997         | 0.990 | <b>0.109</b> | 0.011 |
| United Arab Emirates            | 0.885                           | 0.989         | 0.967 | <b>0.103</b> | 0.019 |
| United States                   | 0.866                           | 0.995         | 0.986 | 0.072        | 0.017 |
| Uzbekistan                      | 0.852                           | 0.998         | 0.993 | 0.055        | 0.009 |
| Viet Nam                        | 0.880                           | 0.999         | 0.996 | 0.056        | 0.008 |
| International pooled data       | 0.861                           | 0.996         | 0.988 | 0.070        | 0.012 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.857                           | 0.997         | 0.991 | 0.069        | 0.011 |
| Belgium                         | 0.832                           | 1.000         | 1.000 | 0.000        | 0.002 |
| Flemish Community (Belgium)     | 0.831                           | 1.000         | 1.002 | 0.000        | 0.001 |
| French Community (Belgium)      | 0.837                           | 0.999         | 0.997 | 0.033        | 0.008 |
| Brazil                          | 0.863                           | 0.994         | 0.982 | 0.089        | 0.015 |
| France                          | 0.750                           | 1.000         | 1.000 | 0.007        | 0.007 |
| Japan                           | 0.837                           | 0.998         | 0.993 | 0.054        | 0.008 |
| Korea                           | 0.901                           | 1.000         | 1.000 | 0.021        | 0.004 |
| Morocco                         | 0.839                           | 0.992         | 0.977 | 0.075        | 0.018 |
| Netherlands                     | 0.813                           | 0.998         | 0.995 | 0.037        | 0.012 |
| New Zealand                     | 0.825                           | 0.998         | 0.993 | 0.054        | 0.012 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.905                           | 0.995         | 0.985 | <b>0.116</b> | 0.016 |
| Slovenia                        | 0.837                           | 0.996         | 0.989 | 0.067        | 0.012 |
| Spain                           | 0.869                           | 0.999         | 0.996 | 0.034        | 0.008 |
| Türkiye                         | 0.922                           | 0.999         | 0.996 | 0.071        | 0.009 |
| United Arab Emirates            | 0.837                           | 0.993         | 0.980 | 0.081        | 0.018 |
| International pooled data       | 0.854                           | 0.998         | 0.993 | 0.053        | 0.009 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.860                           | 0.999         | 0.997 | 0.043        | 0.008 |
| Denmark                         | 0.665                           | 0.990         | 0.971 | 0.046        | 0.017 |
| Flemish Community (Belgium)     | 0.811                           | 0.999         | 0.997 | 0.029        | 0.007 |
| Portugal                        | 0.855                           | 0.996         | 0.988 | 0.073        | 0.013 |
| Saudi Arabia                    | 0.930                           | 0.995         | 0.986 | <b>0.148</b> | 0.014 |
| Slovenia                        | 0.857                           | 0.996         | 0.988 | 0.076        | 0.013 |
| Türkiye                         | 0.905                           | 1.000         | 1.000 | 0.016        | 0.003 |
| United Arab Emirates            | 0.881                           | 0.997         | 0.992 | 0.053        | 0.012 |
| International pooled data       | 0.864                           | 0.994         | 0.982 | 0.087        | 0.015 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.114. Measurement invariance results from MGCFA for scale T4PBLE with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.997     | 0.992 | 0.068 | 0.011 | -                       | -      | -       | -      |
| Equal loadings                | 0.991     | 0.989 | 0.076 | 0.023 | -0.006                  | -0.002 | 0.009   | 0.012  |
| Equal loadings and thresholds | 0.962     | 0.980 | 0.103 | 0.114 | -0.030                  | -0.009 | 0.027   | 0.091  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.115. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PBLE**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G56A | 0.764   | -1.932      | -0.663      | 0.729       |
| TT4G56B | 0.806   | -2.014      | -0.866      | 0.520       |
| TT4G56C | 0.854   | -2.111      | -0.827      | 0.613       |
| TT4G56D | 0.717   | -1.866      | -0.728      | 0.644       |

Source: OECD, TALIS 2024 database.

### Autonomy of teaching (T4AUTCH)

Teachers answered four items measuring *Autonomy of teaching* (T4AUTCH). These items were TT4G57A, TT4G57B, TT4G57C and TT4G57E. Each item had four response categories: “No autonomy”, “Limited autonomy”, “Substantial autonomy” and “Full autonomy”. Higher values on this scale indicate a higher autonomy of teaching. Table 11.116 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.117. The scale T4AUTCH has high reliability (above 0.700) in all populations. As can be observed from Table 11.117, the CFI, TLI and SRMR for T4AUTCH are all within the acceptable cut-off criteria for all participants. However, the RMSEA exceeds the cut-off criterion in 20 of the ISCED level 2 participants (Albania, Australia, Austria, Azerbaijan, Chile, Colombia, Iceland, Israel, Japan, Korea, Latvia, Malta, New Zealand, Poland, Portugal, Serbia, Shanghai (China), Singapore, Spain and Türkiye), 4 ISCED level 1 participants (France, Japan, Korea and the Netherlands) and 3 ISCED level 3 participants (Portugal, Slovenia and Türkiye).

Table 11.118 presents the results from the measurement invariance testing for T4AUTCH for the ISCED level 2 population. The baseline model shows an acceptable model fit with the exception of the RMSEA which is very close to the cut-off. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA and SRMR and close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA, close for the CFI and exceeds the acceptable range for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.119 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4AUTCH. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.116. Items and response categories used in the construction of scale T4AUTCH**

| Scale or item | Question or item wording                                                                                                   |
|---------------|----------------------------------------------------------------------------------------------------------------------------|
| T4AUTCH       | How much autonomy do you have over the following aspects of planning and teaching in the <target class>?                   |
|               | <i>Recoded response categories for scaling: 1=No autonomy; 2=Limited autonomy; 3=Substantial autonomy; 4=Full autonomy</i> |
|               | Scale mid-point: 2.5                                                                                                       |
| TT4G57A       | Implementing the curriculum in a flexible way                                                                              |
| TT4G57B       | Selecting teaching methods and strategies                                                                                  |
| TT4G57C       | Choosing assessment activities                                                                                             |
| TT4G57E       | Designing and preparing lessons                                                                                            |

Source: OECD, TALIS 2024 database.

**Table 11.117. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4AUTCH**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.840            | 0.988         | 0.964 | <b>0.107</b> | 0.023 |
| Alberta (Canada)                | 0.933            | 1.000         | 1.000 | 0.009        | 0.004 |
| Australia                       | 0.884            | 0.980         | 0.941 | <b>0.232</b> | 0.038 |
| Austria                         | 0.840            | 0.986         | 0.958 | <b>0.125</b> | 0.028 |



| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Azerbaijan                      | 0.851                           | 0.991         | 0.973 | <b>0.104</b> | 0.017 |
| Bahrain                         | 0.890                           | 1.000         | 1.000 | 0.017        | 0.004 |
| Belgium                         | 0.872                           | 0.998         | 0.993 | 0.061        | 0.011 |
| Flemish Community (Belgium)     | 0.860                           | 0.994         | 0.983 | 0.090        | 0.020 |
| French Community (Belgium)      | 0.883                           | 1.000         | 1.000 | 0.005        | 0.003 |
| Brazil                          | 0.897                           | 1.000         | 0.999 | 0.021        | 0.005 |
| Bulgaria                        | 0.902                           | 0.999         | 0.997 | 0.046        | 0.008 |
| Chile                           | 0.919                           | 0.992         | 0.977 | <b>0.120</b> | 0.017 |
| Colombia                        | 0.892                           | 0.994         | 0.982 | <b>0.113</b> | 0.017 |
| Costa Rica                      | 0.864                           | 0.999         | 0.997 | 0.033        | 0.007 |
| Croatia                         | 0.886                           | 0.999         | 0.998 | 0.044        | 0.008 |
| Cyprus                          | 0.831                           | 0.995         | 0.985 | 0.087        | 0.016 |
| Czechia                         | 0.851                           | 0.998         | 0.993 | 0.061        | 0.012 |
| Denmark                         | 0.912                           | 1.000         | 1.001 | 0.000        | 0.001 |
| Estonia                         | 0.864                           | 0.995         | 0.984 | 0.093        | 0.017 |
| Finland                         | 0.861                           | 0.993         | 0.980 | 0.091        | 0.020 |
| France                          | 0.901                           | 0.996         | 0.989 | 0.093        | 0.015 |
| Hungary                         | 0.875                           | 0.997         | 0.992 | 0.065        | 0.012 |
| Iceland                         | 0.850                           | 0.995         | 0.984 | <b>0.106</b> | 0.021 |
| Israel                          | 0.876                           | 0.993         | 0.978 | <b>0.121</b> | 0.025 |
| Italy                           | 0.905                           | 1.000         | 0.999 | 0.023        | 0.005 |
| Japan                           | 0.916                           | 0.997         | 0.992 | <b>0.115</b> | 0.012 |
| Kazakhstan                      | 0.867                           | 0.998         | 0.994 | 0.052        | 0.009 |
| Korea                           | 0.906                           | 0.990         | 0.970 | <b>0.222</b> | 0.032 |
| Kosovo                          | 0.907                           | 0.998         | 0.993 | 0.070        | 0.010 |
| Latvia                          | 0.830                           | 0.985         | 0.956 | <b>0.133</b> | 0.029 |
| Lithuania                       | 0.893                           | 0.997         | 0.991 | 0.077        | 0.012 |
| Malta                           | 0.831                           | 0.983         | 0.949 | <b>0.148</b> | 0.030 |
| Montenegro                      | 0.901                           | 1.000         | 0.999 | 0.036        | 0.005 |
| Morocco                         | 0.849                           | 0.998         | 0.994 | 0.038        | 0.008 |
| Netherlands                     | 0.854                           | 0.994         | 0.983 | 0.081        | 0.023 |
| New Zealand                     | 0.891                           | 0.988         | 0.963 | <b>0.159</b> | 0.028 |
| North Macedonia                 | 0.909                           | 0.999         | 0.996 | 0.069        | 0.009 |
| Norway                          | 0.921                           | 0.999         | 0.996 | 0.080        | 0.008 |
| Poland                          | 0.822                           | 0.990         | 0.971 | <b>0.104</b> | 0.029 |
| Portugal                        | 0.828                           | 0.986         | 0.959 | <b>0.136</b> | 0.037 |
| Romania                         | 0.896                           | 0.998         | 0.994 | 0.065        | 0.013 |
| Saudi Arabia                    | 0.921                           | 1.000         | 1.000 | 0.000        | 0.002 |
| Serbia                          | 0.892                           | 0.995         | 0.985 | <b>0.105</b> | 0.016 |
| Shanghai (China)                | 0.937                           | 0.996         | 0.989 | <b>0.181</b> | 0.010 |
| Singapore                       | 0.874                           | 0.984         | 0.953 | <b>0.193</b> | 0.032 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Slovak Republic                 | 0.869                           | 0.998         | 0.995 | 0.064        | 0.015 |
| Slovenia                        | 0.828                           | 0.989         | 0.966 | 0.096        | 0.022 |
| South Africa                    | 0.882                           | 0.993         | 0.980 | 0.094        | 0.018 |
| Spain                           | 0.860                           | 0.983         | 0.950 | <b>0.127</b> | 0.028 |
| Sweden                          | 0.908                           | 0.997         | 0.990 | 0.094        | 0.016 |
| Türkiye                         | 0.912                           | 0.994         | 0.982 | <b>0.136</b> | 0.014 |
| United Arab Emirates            | 0.895                           | 1.000         | 1.000 | 0.011        | 0.004 |
| United States                   | 0.950                           | 0.999         | 0.998 | 0.051        | 0.005 |
| Uzbekistan                      | 0.893                           | 0.998         | 0.994 | 0.069        | 0.008 |
| Viet Nam                        | 0.925                           | 0.999         | 0.998 | 0.043        | 0.004 |
| International pooled data       | 0.880                           | 0.997         | 0.992 | 0.063        | 0.010 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.920                           | 1.000         | 0.999 | 0.025        | 0.004 |
| Belgium                         | 0.868                           | 0.998         | 0.994 | 0.056        | 0.010 |
| Flemish Community (Belgium)     | 0.832                           | 0.998         | 0.995 | 0.044        | 0.010 |
| French Community (Belgium)      | 0.910                           | 0.998         | 0.995 | 0.073        | 0.009 |
| Brazil                          | 0.905                           | 0.995         | 0.984 | 0.089        | 0.018 |
| France                          | 0.900                           | 0.994         | 0.983 | <b>0.112</b> | 0.017 |
| Japan                           | 0.897                           | 0.997         | 0.991 | <b>0.106</b> | 0.014 |
| Korea                           | 0.913                           | 0.994         | 0.983 | <b>0.155</b> | 0.019 |
| Morocco                         | 0.859                           | 0.999         | 0.996 | 0.036        | 0.008 |
| Netherlands                     | 0.897                           | 0.993         | 0.979 | <b>0.131</b> | 0.027 |
| New Zealand                     | 0.857                           | 1.000         | 0.999 | 0.026        | 0.008 |
| Saudi Arabia                    | 0.922                           | 0.999         | 0.997 | 0.059        | 0.007 |
| Slovenia                        | 0.847                           | 0.998         | 0.993 | 0.054        | 0.011 |
| Spain                           | 0.898                           | 0.999         | 0.998 | 0.029        | 0.007 |
| Türkiye                         | 0.914                           | 1.000         | 1.000 | 0.018        | 0.003 |
| United Arab Emirates            | 0.897                           | 1.000         | 0.999 | 0.021        | 0.004 |
| International pooled data       | 0.883                           | 0.999         | 0.997 | 0.043        | 0.006 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.890                           | 0.999         | 0.998 | 0.038        | 0.006 |
| Denmark                         | 0.891                           | 1.000         | 1.000 | 0.018        | 0.005 |
| Flemish Community (Belgium)     | 0.873                           | 0.995         | 0.986 | 0.086        | 0.017 |
| Portugal                        | 0.805                           | 0.978         | 0.935 | <b>0.160</b> | 0.041 |
| Saudi Arabia                    | 0.925                           | 1.000         | 1.000 | 0.009        | 0.002 |
| Slovenia                        | 0.853                           | 0.989         | 0.968 | <b>0.118</b> | 0.023 |
| Türkiye                         | 0.894                           | 0.997         | 0.990 | 0.100        | 0.012 |
| United Arab Emirates            | 0.887                           | 1.000         | 0.999 | 0.020        | 0.006 |
| International pooled data       | 0.875                           | 0.995         | 0.986 | 0.082        | 0.014 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.118. Measurement invariance results from MGCFA for scale T4AUTCH with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.995     | 0.986 | 0.102 | 0.015 | -                       | -      | -       | -      |
| Equal loadings                | 0.988     | 0.985 | 0.105 | 0.032 | -0.008                  | -0.001 | 0.003   | 0.017  |
| Equal loadings and thresholds | 0.970     | 0.985 | 0.106 | 0.124 | -0.017                  | -0.000 | 0.000   | 0.092  |

Note: Alberta (Canada), Bulgaria, the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.119. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4AUTCH**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G57A | 0.723   | -1.818      | -0.647      | 0.604       |
| TT4G57B | 0.908   | -2.349      | -1.302      | 0.113       |
| TT4G57C | 0.766   | -1.978      | -0.862      | 0.358       |
| TT4G57E | 0.829   | -2.277      | -1.351      | -0.116      |

Source: OECD, TALIS 2024 database.

### **Fulfilment of lesson aims (complexity of teaching) (T4FULFIL)**

The scale of *Fulfilment of lesson aims (complexity of teaching)* (T4FULFIL) was measured by a set of five items (TT4G58A, TT4G58B, TT4G58C, TT4G58D and TT4G58E). These items assessed the extent to which teachers believed they had achieved various instructional goals, reflecting the complexity of the teaching activity, in their recently taught lessons. For each goal, they selected from the following response options: “Not at all”, “To some extent”, “Quite a bit” and “A lot” (see Table 11.120). Higher scores indicate a greater perceived fulfilment of lesson aims by teachers.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.121. The scale T4FULFIL has good reliability (above 0.700) in all populations. In terms of model fit of the scale T4FULFIL, the CFI is within the cut-off criterion for all participants. The TLI is also within the cut-off for all participants except for the ISCED level 2 population in Finland. The RMSEA exceeds the cut-off criterion in 11 ISCED level 2 participants (Australia, Austria, Czechia, Estonia, Finland, Iceland, Malta, Montenegro, New Zealand, North Macedonia and South Africa), 4 ISCED level 1 participants (Australia, Brazil, New Zealand and Slovenia) and in the ISCED level 3 population in Slovenia. The SRMR is at least within the acceptable range in all populations.

Table 11.122 presents the results from the measurement invariance testing for T4FULFIL for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA and exceeds the cut-offs for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.123 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4FULFIL. All items show high loadings. Results by participating country/territory show a low loading for item TT4G58A in Finland (ISCED level 2).

**Table 11.120. Items and response categories used in the construction of scale T4FULFIL**

| Scale or item | Question or item wording                                                                                                                                                    |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4FULFIL      | Teaching is a complex activity with often competing goals. To what extent have the lessons you taught over the past week in the <target class> achieved the following aims? |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i>                                                                      |
|               | Scale mid-point: 2.5                                                                                                                                                        |
| TT4G58A       | Presenting the content in a comprehensible way                                                                                                                              |
| TT4G58B       | Engaging students in work that challenges them                                                                                                                              |
| TT4G58C       | Providing students with feedback to support their learning                                                                                                                  |
| TT4G58D       | Offering students opportunities to practise what they learned                                                                                                               |
| TT4G58E       | Adapting teaching to meet the different needs of students                                                                                                                   |

Source: OECD, TALIS 2024 database.

**Table 11.121. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4FULFIL**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |              |              |       |
| Albania                         | 0.855            | 0.993         | 0.985        | 0.046        | 0.020 |
| Alberta (Canada)                | 0.867            | 0.988         | 0.977        | 0.069        | 0.025 |
| Australia                       | 0.867            | 0.983         | 0.967        | <b>0.103</b> | 0.025 |
| Austria                         | 0.782            | 0.961         | 0.922        | <b>0.103</b> | 0.036 |
| Azerbaijan                      | 0.822            | 0.995         | 0.991        | 0.041        | 0.012 |
| Bahrain                         | 0.933            | 0.996         | 0.993        | 0.056        | 0.013 |
| Belgium                         | 0.786            | 0.977         | 0.954        | 0.079        | 0.029 |
| Flemish Community (Belgium)     | 0.772            | 0.962         | 0.924        | 0.095        | 0.037 |
| French Community (Belgium)      | 0.784            | 0.989         | 0.979        | 0.057        | 0.020 |
| Brazil                          | 0.883            | 0.987         | 0.975        | 0.086        | 0.024 |
| Bulgaria                        | 0.881            | 0.996         | 0.993        | 0.045        | 0.013 |
| Chile                           | 0.872            | 0.994         | 0.987        | 0.050        | 0.019 |
| Colombia                        | 0.887            | 0.993         | 0.986        | 0.062        | 0.019 |
| Costa Rica                      | 0.916            | 0.994         | 0.988        | 0.072        | 0.014 |
| Croatia                         | 0.870            | 0.988         | 0.976        | 0.090        | 0.023 |
| Cyprus                          | 0.883            | 0.997         | 0.994        | 0.046        | 0.012 |
| Czechia                         | 0.821            | 0.970         | 0.941        | <b>0.106</b> | 0.033 |
| Denmark                         | 0.776            | 0.974         | 0.947        | 0.077        | 0.028 |
| Estonia                         | 0.839            | 0.969         | 0.939        | <b>0.124</b> | 0.033 |
| Finland                         | 0.740            | 0.943         | <b>0.887</b> | <b>0.112</b> | 0.038 |
| France                          | 0.779            | 0.993         | 0.986        | 0.044        | 0.017 |
| Hungary                         | 0.822            | 0.967         | 0.934        | 0.087        | 0.037 |
| Iceland                         | 0.856            | 0.972         | 0.943        | <b>0.145</b> | 0.035 |
| Israel                          | 0.877            | 0.989         | 0.977        | 0.080        | 0.023 |
| Italy                           | 0.846            | 0.990         | 0.980        | 0.068        | 0.021 |
| Japan                           | 0.869            | 0.996         | 0.992        | 0.055        | 0.011 |
| Kazakhstan                      | 0.874            | 0.995         | 0.989        | 0.055        | 0.014 |
| Korea                           | 0.918            | 0.999         | 0.997        | 0.049        | 0.008 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Kosovo                          | 0.884                           | 0.992         | 0.985 | 0.065        | 0.018 |
| Latvia                          | 0.825                           | 0.997         | 0.995 | 0.026        | 0.011 |
| Lithuania                       | 0.892                           | 0.989         | 0.978 | 0.090        | 0.023 |
| Malta                           | 0.873                           | 0.981         | 0.963 | <b>0.121</b> | 0.027 |
| Montenegro                      | 0.916                           | 0.992         | 0.984 | <b>0.109</b> | 0.024 |
| Morocco                         | 0.841                           | 0.989         | 0.979 | 0.053        | 0.019 |
| Netherlands                     | 0.880                           | 0.991         | 0.982 | 0.067        | 0.020 |
| New Zealand                     | 0.830                           | 0.957         | 0.913 | <b>0.129</b> | 0.041 |
| North Macedonia                 | 0.911                           | 0.984         | 0.968 | <b>0.145</b> | 0.028 |
| Norway                          | 0.807                           | 0.977         | 0.954 | 0.084        | 0.027 |
| Poland                          | 0.882                           | 0.991         | 0.983 | 0.061        | 0.019 |
| Portugal                        | 0.870                           | 0.995         | 0.991 | 0.052        | 0.015 |
| Romania                         | 0.903                           | 0.995         | 0.990 | 0.064        | 0.017 |
| Saudi Arabia                    | 0.943                           | 0.997         | 0.994 | 0.069        | 0.011 |
| Serbia                          | 0.901                           | 0.994         | 0.987 | 0.082        | 0.018 |
| Shanghai (China)                | 0.953                           | 0.999         | 0.998 | 0.074        | 0.008 |
| Singapore                       | 0.906                           | 0.995         | 0.991 | 0.066        | 0.013 |
| Slovak Republic                 | 0.859                           | 0.994         | 0.988 | 0.055        | 0.016 |
| Slovenia                        | 0.835                           | 0.987         | 0.974 | 0.068        | 0.023 |
| South Africa                    | 0.894                           | 0.984         | 0.968 | <b>0.103</b> | 0.029 |
| Spain                           | 0.859                           | 0.988         | 0.976 | 0.063        | 0.021 |
| Sweden                          | 0.817                           | 0.983         | 0.966 | 0.075        | 0.024 |
| Türkiye                         | 0.871                           | 0.989         | 0.979 | 0.097        | 0.019 |
| United Arab Emirates            | 0.904                           | 0.993         | 0.986 | 0.051        | 0.019 |
| United States                   | 0.881                           | 0.992         | 0.983 | 0.053        | 0.021 |
| Uzbekistan                      | 0.893                           | 0.998         | 0.995 | 0.042        | 0.011 |
| Viet Nam                        | 0.902                           | 0.997         | 0.995 | 0.058        | 0.011 |
| International pooled data       | 0.881                           | 0.994         | 0.988 | 0.061        | 0.015 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.907                           | 0.985         | 0.970 | <b>0.122</b> | 0.025 |
| Belgium                         | 0.843                           | 0.988         | 0.977 | 0.067        | 0.021 |
| Flemish Community (Belgium)     | 0.846                           | 0.980         | 0.960 | 0.089        | 0.029 |
| French Community (Belgium)      | 0.813                           | 0.991         | 0.983 | 0.055        | 0.018 |
| Brazil                          | 0.879                           | 0.971         | 0.942 | <b>0.114</b> | 0.039 |
| France                          | 0.811                           | 0.989         | 0.978 | 0.060        | 0.021 |
| Japan                           | 0.870                           | 0.998         | 0.996 | 0.037        | 0.009 |
| Korea                           | 0.933                           | 0.996         | 0.992 | 0.088        | 0.013 |
| Morocco                         | 0.848                           | 0.984         | 0.967 | 0.064        | 0.024 |
| Netherlands                     | 0.936                           | 0.995         | 0.989 | 0.092        | 0.018 |
| New Zealand                     | 0.891                           | 0.978         | 0.956 | <b>0.125</b> | 0.035 |
| Saudi Arabia                    | 0.949                           | 0.996         | 0.992 | 0.083        | 0.011 |
| Slovenia                        | 0.854                           | 0.976         | 0.952 | <b>0.110</b> | 0.031 |
| Spain                           | 0.887                           | 0.988         | 0.976 | 0.071        | 0.022 |
| Türkiye                         | 0.897                           | 0.992         | 0.984 | 0.098        | 0.018 |
| United Arab Emirates            | 0.897                           | 1.000         | 1.000 | 0.005        | 0.006 |
| International pooled data       | 0.905                           | 0.995         | 0.991 | 0.060        | 0.012 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.875                           | 0.990         | 0.980 | 0.084        | 0.022 |
| Denmark                         | 0.761                           | 0.959         | 0.919 | 0.082        | 0.034 |
| Flemish Community (Belgium)     | 0.784                           | 0.975         | 0.949 | 0.082        | 0.031 |
| Portugal                        | 0.864                           | 0.997         | 0.994 | 0.044        | 0.012 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.945                           | 0.999         | 0.998 | 0.045        | 0.007 |
| Slovenia                        | 0.845                           | 0.971         | 0.942 | <b>0.117</b> | 0.035 |
| Türkiye                         | 0.863                           | 0.991         | 0.983 | 0.087        | 0.018 |
| United Arab Emirates            | 0.904                           | 0.998         | 0.996 | 0.028        | 0.012 |
| International pooled data       | 0.877                           | 0.993         | 0.987 | 0.061        | 0.016 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.122. Measurement invariance results from MGCFA for scale T4FULFIL with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.992     | 0.985 | 0.077 | 0.020 | -                       | -      | -       | -      |
| Equal loadings                | 0.988     | 0.987 | 0.072 | 0.029 | -0.004                  | 0.002  | -0.005  | 0.009  |
| Equal loadings and thresholds | 0.970     | 0.983 | 0.081 | 0.113 | -0.019                  | -0.004 | 0.010   | 0.084  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.123. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4FULFIL**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G58A | 0.746   | -2.605      | -1.390      | 0.191       |
| TT4G58B | 0.756   | -2.230      | -0.851      | 0.547       |
| TT4G58C | 0.832   | -2.349      | -1.027      | 0.353       |
| TT4G58D | 0.807   | -2.286      | -1.104      | 0.223       |
| TT4G58E | 0.764   | -2.199      | -0.827      | 0.474       |

Source: OECD, TALIS 2024 database.

### **Empathy with students (T4EMPS)**

The *Empathy with students* (T4EMPS) scale was measured using a set of four items (TT4G60A, TT4G60B, TT4G60C and TT4G60D). For each item, teachers were asked to indicate the extent to which they felt capable of performing different empathy-related behaviours, using the following response categories: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher values on this scale indicate a greater perceived capacity to demonstrate empathy toward students. Table 11.124 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.125. The reliabilities for T4EMPS are high (above 0.800) in all populations. As can be seen in Table 11.125, the CFI, TLI and SRMR of T4EMPS meet the cut-off criteria in all of the participating countries/territories. The RMSEA is above the cut-off criterion in 13 ISCED level 2 participants (Brazil, Costa Rica, Finland, Hungary, Japan, Kazakhstan, Latvia, Montenegro, North Macedonia, the

Slovak Republic, Sweden, Uzbekistan and Viet Nam), in the ISCED level 1 population in Japan and in the ISCED level 3 population in Portugal.

Table 11.126 presents the results from the measurement invariance testing for T4EMPS for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI and TLI, close for the RMSEA and exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.127 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4EMPS. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.124. Items and response categories used in the construction of scale T4EMPS**

| Scale or item | Question or item wording                                                                               |
|---------------|--------------------------------------------------------------------------------------------------------|
| T4EMPS        | In your practice in the <target class>, to what extent can you do the following?                       |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i> |
|               | Scale mid-point: 2.5                                                                                   |
| TT4G60A       | Be aware of my students' feelings                                                                      |
| TT4G60B       | Show warmth to my students                                                                             |
| TT4G60C       | Care about the problems of my students                                                                 |
| TT4G60D       | Be empathetic towards my students                                                                      |

Source: OECD, TALIS 2024 database.

**Table 11.125. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4EMPS**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.889            | 1.000         | 1.000 | 0.000        | 0.004 |
| Alberta (Canada)                | 0.952            | 1.000         | 0.999 | 0.051        | 0.007 |
| Australia                       | 0.954            | 1.000         | 0.999 | 0.060        | 0.006 |
| Austria                         | 0.909            | 0.998         | 0.995 | 0.068        | 0.011 |
| Azerbaijan                      | 0.883            | 1.000         | 0.999 | 0.033        | 0.005 |
| Bahrain                         | 0.941            | 0.999         | 0.996 | 0.066        | 0.010 |
| Belgium                         | 0.925            | 0.999         | 0.997 | 0.062        | 0.008 |
| Flemish Community (Belgium)     | 0.925            | 0.999         | 0.998 | 0.051        | 0.008 |
| French Community (Belgium)      | 0.926            | 0.998         | 0.993 | 0.096        | 0.010 |
| Brazil                          | 0.874            | 0.985         | 0.956 | <b>0.111</b> | 0.023 |
| Bulgaria                        | 0.919            | 0.998         | 0.995 | 0.072        | 0.011 |
| Chile                           | 0.938            | 1.000         | 0.999 | 0.030        | 0.005 |
| Colombia                        | 0.919            | 0.996         | 0.989 | 0.097        | 0.014 |
| Costa Rica                      | 0.939            | 0.996         | 0.989 | <b>0.113</b> | 0.013 |
| Croatia                         | 0.942            | 0.999         | 0.998 | 0.079        | 0.010 |
| Cyprus                          | 0.921            | 1.000         | 0.999 | 0.028        | 0.006 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Czechia                         | 0.924                           | 0.999         | 0.997 | 0.056        | 0.008 |
| Denmark                         | 0.953                           | 0.999         | 0.998 | 0.061        | 0.008 |
| Estonia                         | 0.905                           | 0.999         | 0.996 | 0.095        | 0.016 |
| Finland                         | 0.906                           | 0.997         | 0.991 | <b>0.123</b> | 0.021 |
| France                          | 0.893                           | 0.999         | 0.998 | 0.040        | 0.008 |
| Hungary                         | 0.915                           | 0.994         | 0.981 | <b>0.116</b> | 0.019 |
| Iceland                         | 0.939                           | 1.000         | 1.000 | 0.039        | 0.007 |
| Israel                          | 0.929                           | 1.000         | 0.999 | 0.060        | 0.011 |
| Italy                           | 0.895                           | 1.000         | 1.000 | 0.010        | 0.004 |
| Japan                           | 0.962                           | 0.999         | 0.997 | <b>0.118</b> | 0.007 |
| Kazakhstan                      | 0.901                           | 0.994         | 0.982 | <b>0.107</b> | 0.018 |
| Korea                           | 0.941                           | 0.999         | 0.998 | 0.082        | 0.009 |
| Kosovo                          | 0.889                           | 1.000         | 0.999 | 0.029        | 0.007 |
| Latvia                          | 0.877                           | 0.994         | 0.983 | <b>0.102</b> | 0.022 |
| Lithuania                       | 0.894                           | 0.999         | 0.996 | 0.059        | 0.009 |
| Malta                           | 0.951                           | 0.999         | 0.998 | 0.095        | 0.009 |
| Montenegro                      | 0.926                           | 0.998         | 0.994 | 0.100        | 0.009 |
| Morocco                         | 0.879                           | 0.995         | 0.986 | 0.073        | 0.018 |
| Netherlands                     | 0.905                           | 1.000         | 0.999 | 0.025        | 0.008 |
| New Zealand                     | 0.941                           | 0.999         | 0.998 | 0.071        | 0.011 |
| North Macedonia                 | 0.938                           | 0.998         | 0.994 | <b>0.101</b> | 0.010 |
| Norway                          | 0.940                           | 0.999         | 0.997 | 0.098        | 0.012 |
| Poland                          | 0.904                           | 1.000         | 1.000 | 0.000        | 0.003 |
| Portugal                        | 0.930                           | 0.999         | 0.997 | 0.069        | 0.008 |
| Romania                         | 0.939                           | 0.999         | 0.998 | 0.060        | 0.005 |
| Saudi Arabia                    | 0.943                           | 0.999         | 0.998 | 0.055        | 0.006 |
| Serbia                          | 0.925                           | 0.998         | 0.995 | 0.090        | 0.013 |
| Shanghai (China)                | 0.972                           | 1.000         | 1.000 | 0.075        | 0.004 |
| Singapore                       | 0.958                           | 1.000         | 0.999 | 0.069        | 0.006 |
| Slovak Republic                 | 0.912                           | 0.994         | 0.983 | <b>0.153</b> | 0.022 |
| Slovenia                        | 0.915                           | 1.000         | 1.000 | 0.026        | 0.006 |
| South Africa                    | 0.932                           | 0.999         | 0.996 | 0.076        | 0.009 |
| Spain                           | 0.925                           | 0.998         | 0.993 | 0.085        | 0.015 |
| Sweden                          | 0.942                           | 0.997         | 0.992 | <b>0.128</b> | 0.013 |
| Türkiye                         | 0.937                           | 0.999         | 0.996 | 0.085        | 0.010 |
| United Arab Emirates            | 0.936                           | 1.000         | 1.000 | 0.017        | 0.004 |
| United States                   | 0.955                           | 0.998         | 0.995 | 0.080        | 0.010 |
| Uzbekistan                      | 0.918                           | 0.994         | 0.982 | <b>0.134</b> | 0.019 |
| Viet Nam                        | 0.945                           | 0.998         | 0.993 | <b>0.148</b> | 0.014 |
| International pooled data       | 0.924                           | 0.998         | 0.995 | 0.072        | 0.008 |

ISCED level 1



| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Australia                       | 0.966                           | 1.000         | 1.000 | 0.037        | 0.003 |
| Belgium                         | 0.945                           | 1.000         | 0.999 | 0.034        | 0.005 |
| Flemish Community (Belgium)     | 0.945                           | 1.000         | 1.000 | 0.000        | 0.003 |
| French Community (Belgium)      | 0.943                           | 0.999         | 0.997 | 0.066        | 0.008 |
| Brazil                          | 0.871                           | 0.995         | 0.985 | 0.057        | 0.015 |
| France                          | 0.914                           | 1.000         | 1.000 | 0.014        | 0.006 |
| Japan                           | 0.964                           | 0.999         | 0.997 | <b>0.126</b> | 0.009 |
| Korea                           | 0.951                           | 1.000         | 0.999 | 0.049        | 0.005 |
| Morocco                         | 0.874                           | 0.998         | 0.994 | 0.045        | 0.013 |
| Netherlands                     | 0.959                           | 1.000         | 0.999 | 0.033        | 0.009 |
| New Zealand                     | 0.966                           | 0.999         | 0.998 | 0.077        | 0.013 |
| Saudi Arabia                    | 0.960                           | 0.998         | 0.994 | 0.098        | 0.008 |
| Slovenia                        | 0.919                           | 1.000         | 1.000 | 0.024        | 0.004 |
| Spain                           | 0.942                           | 0.999         | 0.998 | 0.054        | 0.010 |
| Türkiye                         | 0.948                           | 0.999         | 0.997 | 0.066        | 0.007 |
| United Arab Emirates            | 0.937                           | 1.000         | 0.999 | 0.029        | 0.007 |
| International pooled data       | 0.943                           | 0.999         | 0.998 | 0.047        | 0.005 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.938                           | 0.998         | 0.995 | 0.099        | 0.013 |
| Denmark                         | 0.933                           | 0.999         | 0.998 | 0.053        | 0.008 |
| Flemish Community (Belgium)     | 0.921                           | 0.998         | 0.994 | 0.086        | 0.013 |
| Portugal                        | 0.929                           | 0.997         | 0.991 | <b>0.114</b> | 0.016 |
| Saudi Arabia                    | 0.945                           | 1.000         | 1.000 | 0.027        | 0.003 |
| Slovenia                        | 0.897                           | 1.000         | 0.999 | 0.036        | 0.006 |
| Türkiye                         | 0.935                           | 1.000         | 0.999 | 0.057        | 0.006 |
| United Arab Emirates            | 0.939                           | 0.999         | 0.998 | 0.038        | 0.008 |
| International pooled data       | 0.931                           | 0.999         | 0.998 | 0.046        | 0.005 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.126. Measurement invariance results from MGCFA for scale T4EMPS with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.999     | 0.996 | 0.086 | 0.010 | -                       | -      | -       | -      |
| Equal loadings                | 0.994     | 0.993 | 0.109 | 0.027 | -0.004                  | -0.003 | 0.023   | 0.016  |
| Equal loadings and thresholds | 0.991     | 0.995 | 0.089 | 0.138 | -0.003                  | 0.002  | -0.020  | 0.112  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), Iceland, the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.127. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4EMPS**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G60A | 0.794   | -2.445      | -0.929      | 0.393       |
| TT4G60B | 0.896   | -2.561      | -1.290      | 0.024       |
| TT4G60C | 0.904   | -2.505      | -1.160      | 0.085       |
| TT4G60D | 0.871   | -2.416      | -1.404      | -0.063      |

Source: OECD, TALIS 2024 database.

### **Social and emotional skill development (T4SESDEV)**

The scale *Social and emotional skill development* (T4SESDEV) was measured using a set of four items, for which teachers had to indicate the frequency with which they focus on developing different aspects of students' social and emotional skills. These items were TT4G61B, TT4G61D, TT4G61E and TT4G61F, and had four response categories: "Never or almost never", "Occasionally", "Frequently" and "Always". Higher values on this scale indicate a higher focus on students' social and emotional skill development. Table 11.128 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.129. The scale T4SESDEV has high reliability (above 0.700) in all populations. As can be observed from Table 11.129, the CFI, TLI and SRMR for T4SESDEV are all within the acceptable cut-off criteria across all populations. The RMSEA exceeded the cut-off criterion in 23 of the ISCED level 2 participants, 7 of the ISCED level 1 participants, and 6 of the ISCED level 3 participants. Most of the exceeding RMSEA values are between 0.100 and 0.150, except for the following ISCED level 2 participants: Costa Rica, Italy, Lithuania, Montenegro, Shanghai (China) and Türkiye.

Table 11.130 presents the results from the measurement invariance testing for T4SESDEV for the ISCED level 2 population. The baseline model shows an acceptable model fit with the exception of the RMSEA which is very close to the cut-off. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI and TLI, close for the RMSEA and exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.131 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4SESDEV. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.128. Items and response categories used in the construction of scale T4SESDEV**

| Scale or item | Question or item wording                                                                                                                                                                                                                                          |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4SESDEV      | Thinking about your teaching in the <target class>, how often do you focus on developing the following student skills?<br><i>Recoded response categories for scaling: 1=Never or almost never; 2=Occasionally; 3=Frequently; 4=Always</i><br>Scale mid-point: 2.5 |
| TT4G61B       | Managing their own emotions, thoughts or behaviour                                                                                                                                                                                                                |
| TT4G61D       | Empathising with others                                                                                                                                                                                                                                           |
| TT4G61E       | Establishing and maintaining healthy relationships with others                                                                                                                                                                                                    |
| TT4G61F       | Making caring and constructive choices about their personal actions                                                                                                                                                                                               |

Source: OECD, TALIS 2024 database.

**Table 11.129. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4SESEDEV**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.910            | 0.996         | 0.989 | 0.083        | 0.013 |
| Alberta (Canada)                | 0.921            | 1.000         | 0.999 | 0.034        | 0.006 |
| Australia                       | 0.943            | 0.999         | 0.996 | <b>0.106</b> | 0.009 |
| Austria                         | 0.872            | 0.997         | 0.991 | 0.077        | 0.012 |
| Azerbaijan                      | 0.865            | 1.000         | 1.000 | 0.000        | 0.002 |
| Bahrain                         | 0.953            | 0.999         | 0.998 | 0.070        | 0.006 |
| Belgium                         | 0.921            | 0.998         | 0.994 | <b>0.101</b> | 0.012 |
| Flemish Community (Belgium)     | 0.926            | 0.999         | 0.996 | 0.090        | 0.011 |
| French Community (Belgium)      | 0.918            | 0.999         | 0.997 | 0.074        | 0.009 |
| Brazil                          | 0.918            | 0.998         | 0.994 | 0.085        | 0.012 |
| Bulgaria                        | 0.906            | 0.996         | 0.988 | <b>0.108</b> | 0.015 |
| Chile                           | 0.938            | 0.997         | 0.992 | <b>0.110</b> | 0.015 |
| Colombia                        | 0.886            | 0.997         | 0.991 | 0.081        | 0.013 |
| Costa Rica                      | 0.928            | 0.995         | 0.985 | <b>0.161</b> | 0.018 |
| Croatia                         | 0.915            | 0.997         | 0.991 | <b>0.106</b> | 0.015 |
| Cyprus                          | 0.927            | 0.997         | 0.992 | <b>0.109</b> | 0.012 |
| Czechia                         | 0.911            | 0.998         | 0.993 | 0.097        | 0.013 |
| Denmark                         | 0.908            | 0.999         | 0.998 | 0.042        | 0.007 |
| Estonia                         | 0.892            | 0.998         | 0.993 | 0.089        | 0.012 |
| Finland                         | 0.921            | 0.999         | 0.996 | 0.072        | 0.009 |
| France                          | 0.902            | 0.995         | 0.984 | <b>0.135</b> | 0.019 |
| Hungary                         | 0.914            | 0.997         | 0.990 | <b>0.115</b> | 0.015 |
| Iceland                         | 0.943            | 0.999         | 0.998 | 0.096        | 0.009 |
| Israel                          | 0.932            | 0.998         | 0.993 | <b>0.106</b> | 0.013 |
| Italy                           | 0.929            | 0.996         | 0.987 | <b>0.151</b> | 0.017 |
| Japan                           | 0.947            | 1.000         | 0.999 | 0.061        | 0.005 |
| Kazakhstan                      | 0.893            | 0.999         | 0.997 | 0.051        | 0.008 |
| Korea                           | 0.957            | 0.999         | 0.997 | <b>0.108</b> | 0.007 |
| Kosovo                          | 0.914            | 0.996         | 0.988 | 0.093        | 0.014 |
| Latvia                          | 0.899            | 0.998         | 0.993 | 0.070        | 0.009 |
| Lithuania                       | 0.918            | 0.992         | 0.976 | <b>0.167</b> | 0.024 |
| Malta                           | 0.945            | 0.999         | 0.997 | 0.098        | 0.008 |
| Montenegro                      | 0.891            | 0.994         | 0.983 | <b>0.178</b> | 0.030 |
| Morocco                         | 0.886            | 0.989         | 0.967 | 0.100        | 0.023 |
| Netherlands                     | 0.880            | 0.995         | 0.984 | 0.088        | 0.019 |
| New Zealand                     | 0.930            | 0.997         | 0.991 | <b>0.132</b> | 0.014 |
| North Macedonia                 | 0.912            | 1.000         | 0.999 | 0.039        | 0.004 |
| Norway                          | 0.925            | 0.998         | 0.994 | 0.089        | 0.011 |
| Poland                          | 0.910            | 0.996         | 0.988 | 0.093        | 0.020 |
| Portugal                        | 0.925            | 0.998         | 0.994 | <b>0.119</b> | 0.019 |
| Romania                         | 0.937            | 0.996         | 0.989 | <b>0.124</b> | 0.016 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.951                           | 0.999         | 0.997 | 0.075        | 0.006 |
| Serbia                          | 0.923                           | 0.997         | 0.991 | <b>0.143</b> | 0.016 |
| Shanghai (China)                | 0.960                           | 0.999         | 0.997 | <b>0.174</b> | 0.010 |
| Singapore                       | 0.949                           | 1.000         | 1.000 | 0.032        | 0.004 |
| Slovak Republic                 | 0.914                           | 0.997         | 0.991 | <b>0.128</b> | 0.017 |
| Slovenia                        | 0.916                           | 0.999         | 0.997 | 0.062        | 0.009 |
| South Africa                    | 0.942                           | 0.998         | 0.995 | 0.089        | 0.012 |
| Spain                           | 0.937                           | 0.997         | 0.992 | 0.100        | 0.012 |
| Sweden                          | 0.923                           | 0.996         | 0.988 | <b>0.119</b> | 0.014 |
| Türkiye                         | 0.949                           | 0.998         | 0.993 | <b>0.160</b> | 0.014 |
| United Arab Emirates            | 0.956                           | 0.999         | 0.997 | 0.056        | 0.006 |
| United States                   | 0.939                           | 0.999         | 0.997 | 0.065        | 0.007 |
| Uzbekistan                      | 0.912                           | 0.998         | 0.993 | 0.080        | 0.009 |
| Viet Nam                        | 0.919                           | 0.999         | 0.997 | 0.070        | 0.008 |
| International pooled data       | 0.925                           | 0.999         | 0.996 | 0.069        | 0.008 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.965                           | 0.999         | 0.998 | 0.098        | 0.006 |
| Belgium                         | 0.935                           | 0.998         | 0.995 | 0.098        | 0.010 |
| Flemish Community (Belgium)     | 0.936                           | 0.999         | 0.997 | 0.075        | 0.009 |
| French Community (Belgium)      | 0.937                           | 0.999         | 0.997 | <b>0.101</b> | 0.011 |
| Brazil                          | 0.905                           | 0.995         | 0.984 | <b>0.114</b> | 0.020 |
| France                          | 0.916                           | 0.998         | 0.993 | 0.092        | 0.016 |
| Japan                           | 0.945                           | 1.000         | 0.999 | 0.051        | 0.004 |
| Korea                           | 0.956                           | 0.999         | 0.998 | 0.082        | 0.006 |
| Morocco                         | 0.892                           | 0.995         | 0.984 | 0.082        | 0.016 |
| Netherlands                     | 0.953                           | 1.000         | 1.000 | 0.000        | 0.007 |
| New Zealand                     | 0.964                           | 0.999         | 0.998 | <b>0.119</b> | 0.009 |
| Saudi Arabia                    | 0.959                           | 0.997         | 0.991 | <b>0.139</b> | 0.012 |
| Slovenia                        | 0.917                           | 0.996         | 0.989 | <b>0.111</b> | 0.013 |
| Spain                           | 0.954                           | 0.999         | 0.998 | 0.048        | 0.006 |
| Türkiye                         | 0.957                           | 0.998         | 0.995 | <b>0.123</b> | 0.010 |
| United Arab Emirates            | 0.945                           | 0.997         | 0.992 | 0.084        | 0.010 |
| International pooled data       | 0.940                           | 0.998         | 0.995 | 0.086        | 0.009 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.904                           | 0.996         | 0.987 | <b>0.147</b> | 0.023 |
| Denmark                         | 0.892                           | 0.995         | 0.985 | <b>0.109</b> | 0.017 |
| Flemish Community (Belgium)     | 0.931                           | 0.999         | 0.998 | 0.063        | 0.007 |
| Portugal                        | 0.926                           | 0.998         | 0.994 | <b>0.131</b> | 0.019 |
| Saudi Arabia                    | 0.952                           | 0.997         | 0.992 | <b>0.120</b> | 0.008 |
| Slovenia                        | 0.915                           | 0.994         | 0.983 | <b>0.143</b> | 0.016 |
| Türkiye                         | 0.946                           | 0.998         | 0.995 | <b>0.134</b> | 0.010 |
| United Arab Emirates            | 0.959                           | 0.999         | 0.997 | 0.068        | 0.008 |
| International pooled data       | 0.940                           | 0.999         | 0.996 | 0.085        | 0.008 |

Note: Coefficients in bold exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.130. Measurement invariance results from MGCFA for scale T4SESDEV with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |       |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|-------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.998     | 0.994 | 0.101 | 0.012 | -                       | -     | -       | -      |
| Equal loadings                | 0.996     | 0.995 | 0.098 | 0.023 | -0.003                  | 0.000 | -0.004  | 0.011  |
| Equal loadings and thresholds | 0.993     | 0.996 | 0.079 | 0.098 | -0.002                  | 0.002 | -0.019  | 0.074  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.131. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4SESDEV**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G61B | 0.786   | -1.959      | -0.641      | 0.675       |
| TT4G61D | 0.876   | -2.247      | -1.019      | 0.354       |
| TT4G61E | 0.925   | -2.307      | -1.137      | 0.250       |
| TT4G61F | 0.891   | -2.223      | -0.969      | 0.413       |

Source: OECD, TALIS 2024 database.

### Opportunities to participate in school decisions (T4OPPART)

Teachers were asked to answer three items measuring *Opportunities to participate in school decisions* (T4OPPART). These items were TT4G64A, TT4G64B and TT4G64C. All items were answered on a four-point scale, with response categories of “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale indicate greater perceived opportunities given to various stakeholders to participate in school decision making. Table 11.132 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.133. The fit indices for T4OPPART are not presented here as the scale was measured by just three items. The reliabilities for T4OPPART are above 0.700 in all populations.

Table 11.134 presents the results from the measurement invariance testing for T4OPPART for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The equal loadings model is showing an acceptable model fit with the exception of the RMSEA. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA, close for the CFI and exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.135 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4OPPART. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.132. Items and response categories used in the construction of scale T4OPPART**

| Scale or item | Question or item wording                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------|
| T4OPPART      | How strongly do you agree or disagree with these statements, as applied to this school?                    |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i> |
|               | Scale mid-point: 2.5                                                                                       |
| TT4G64A       | This school provides staff with opportunities to actively participate in school decisions.                 |
| TT4G64B       | This school provides parents or guardians with opportunities to actively participate in school decisions.  |
| TT4G64C       | This school provides students with opportunities to actively participate in school decisions.              |

Source: OECD, TALIS 2024 database.

**Table 11.133. Reliability coefficient alpha for single countries and pooled model for scale T4OPPART**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.928                           |
| Alberta (Canada)                | 0.880                           |
| Australia                       | 0.903                           |
| Austria                         | 0.847                           |
| Azerbaijan                      | 0.886                           |
| Bahrain                         | 0.915                           |
| Belgium                         | 0.880                           |
| Flemish Community (Belgium)     | 0.891                           |
| French Community (Belgium)      | 0.844                           |
| Brazil                          | 0.922                           |
| Bulgaria                        | 0.905                           |
| Chile                           | 0.902                           |
| Colombia                        | 0.923                           |
| Costa Rica                      | 0.911                           |
| Croatia                         | 0.897                           |
| Cyprus                          | 0.885                           |
| Czechia                         | 0.878                           |
| Denmark                         | 0.786                           |
| Estonia                         | 0.921                           |
| Finland                         | 0.845                           |
| France                          | 0.894                           |
| Hungary                         | 0.916                           |
| Iceland                         | 0.879                           |
| Israel                          | 0.849                           |
| Italy                           | 0.839                           |
| Japan                           | 0.836                           |
| Kazakhstan                      | 0.810                           |
| Korea                           | 0.911                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Kosovo                          | 0.929                           |
| Latvia                          | 0.912                           |
| Lithuania                       | 0.941                           |
| Malta                           | 0.878                           |
| Montenegro                      | 0.914                           |
| Morocco                         | 0.911                           |
| Netherlands                     | 0.890                           |
| New Zealand                     | 0.898                           |
| North Macedonia                 | 0.924                           |
| Norway                          | 0.845                           |
| Poland                          | 0.909                           |
| Portugal                        | 0.913                           |
| Romania                         | 0.890                           |
| Saudi Arabia                    | 0.929                           |
| Serbia                          | 0.907                           |
| Shanghai (China)                | 0.969                           |
| Singapore                       | 0.877                           |
| Slovak Republic                 | 0.882                           |
| Slovenia                        | 0.876                           |
| South Africa                    | 0.921                           |
| Spain                           | 0.924                           |
| Sweden                          | 0.841                           |
| Türkiye                         | 0.927                           |
| United Arab Emirates            | 0.900                           |
| United States                   | 0.915                           |
| Uzbekistan                      | 0.882                           |
| Viet Nam                        | 0.870                           |
| International pooled data       | 0.898                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.907                           |
| Belgium                         | 0.801                           |
| Flemish Community (Belgium)     | 0.841                           |
| French Community (Belgium)      | 0.736                           |
| Brazil                          | 0.888                           |
| France                          | 0.866                           |
| Japan                           | 0.855                           |
| Korea                           | 0.905                           |
| Morocco                         | 0.886                           |
| Netherlands                     | 0.818                           |
| New Zealand                     | 0.907                           |
| Saudi Arabia                    | 0.939                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Slovenia                        | 0.883                           |
| Spain                           | 0.902                           |
| Türkiye                         | 0.931                           |
| United Arab Emirates            | 0.903                           |
| International pooled data       | 0.874                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.939                           |
| Denmark                         | 0.738                           |
| Flemish Community (Belgium)     | 0.871                           |
| Portugal                        | 0.917                           |
| Saudi Arabia                    | 0.945                           |
| Slovenia                        | 0.903                           |
| Türkiye                         | 0.929                           |
| United Arab Emirates            | 0.928                           |
| International pooled data       | 0.900                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.134. Measurement invariance results from MGCFA for scale T4OPPART with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.997     | 0.995 | 0.111 | 0.014 | -0.003                  | -0.005 | 0.111   | 0.014  |
| Equal loadings and thresholds | 0.991     | 0.996 | 0.096 | 0.094 | -0.006                  | 0.001  | -0.015  | 0.080  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.135. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4OPPART**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G64A | 0.816   | -1.734      | -0.867      | 0.757       |
| TT4G64B | 0.879   | -1.887      | -0.829      | 0.856       |
| TT4G64C | 0.902   | -1.812      | -0.691      | 0.955       |

Source: OECD, TALIS 2024 database.



### Teacher leadership (T4TLEAD)

The scale of *Teacher leadership* (T4TLEAD) was measured by a set of four items: TT4G64I, TT4G64J, TT4G64K and TT4G64L. Teachers were asked to indicate their level of agreement with each of these items using the following response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale reflect greater perceived teacher leadership. Table 11.136 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.137. The reliabilities for T4TLEAD are high in all populations, with values mostly above 0.800. In terms of model fit, the scale T4TLEAD has generally a good model fit, with CFI values greater than 0.98 across all populations. The TLI is also above 0.950 in most populations, except for the ISCED level 2 population in Croatia. The RMSEA exceeds the cut-off criterion in 18 of the ISCED level 2 participants, 5 of the ISCED level 1 participants, and 3 of the ISCED level 3 participants. RMSEA values are particularly high, above 0.190, in both the ISCED levels 2 and 3 populations in Croatia, as well as in the ISCED level 2 population in Montenegro and Serbia. The SRMR does not exceed the cut-off criterion in any of the populations.

Table 11.138 presents the results from the measurement invariance testing for T4TLEAD for the ISCED level 2 population. The baseline model shows an acceptable model fit with the exception of the RMSEA. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices except the CFI, whose change is very close to the acceptable range. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI, TLI, close for the RMSEA and exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.139 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4TLEAD. All items show high loadings. Results by participating country/territory show a low loading for item TT4G64L in Uzbekistan (ISCED level 2).

**Table 11.136. Items and response categories used in the construction of scale T4TLEAD**

| Scale or item | Question or item wording                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------|
| T4TLEAD       | How strongly do you agree or disagree with these statements, as applied to this school?                    |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i> |
|               | Scale mid-point: 2.5                                                                                       |
| TT4G64I       | Teachers take leadership roles in promoting a professional learning community.                             |
| TT4G64J       | Teachers initiate and lead collaborative activities.                                                       |
| TT4G64K       | Teachers lead their professional growth and development activities whenever possible.                      |
| TT4G64L       | Teachers participate in non-teaching school events and projects.                                           |

Source: OECD, TALIS 2024 database.

**Table 11.137. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4TLEAD**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.925            | 0.999         | 0.997 | 0.052        | 0.007 |
| Alberta (Canada)                | 0.873            | 0.999         | 0.996 | 0.052        | 0.010 |
| Australia                       | 0.877            | 0.999         | 0.996 | 0.062        | 0.010 |
| Austria                         | 0.795            | 0.986         | 0.957 | <b>0.112</b> | 0.026 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Azerbaijan                      | 0.900                           | 0.999         | 0.997 | 0.050        | 0.007 |
| Bahrain                         | 0.937                           | 1.000         | 0.999 | 0.064        | 0.005 |
| Belgium                         | 0.828                           | 0.999         | 0.997 | 0.032        | 0.007 |
| Flemish Community (Belgium)     | 0.871                           | 0.999         | 0.998 | 0.038        | 0.008 |
| French Community (Belgium)      | 0.753                           | 0.999         | 0.997 | 0.023        | 0.007 |
| Brazil                          | 0.898                           | 0.999         | 0.997 | 0.064        | 0.009 |
| Bulgaria                        | 0.924                           | 0.999         | 0.996 | 0.074        | 0.010 |
| Chile                           | 0.883                           | 0.996         | 0.989 | 0.083        | 0.014 |
| Colombia                        | 0.892                           | 0.995         | 0.984 | <b>0.112</b> | 0.017 |
| Costa Rica                      | 0.916                           | 0.996         | 0.989 | <b>0.116</b> | 0.013 |
| Croatia                         | 0.904                           | 0.981         | 0.944 | <b>0.237</b> | 0.041 |
| Cyprus                          | 0.906                           | 1.000         | 1.000 | 0.023        | 0.004 |
| Czechia                         | 0.853                           | 0.994         | 0.982 | 0.087        | 0.016 |
| Denmark                         | 0.835                           | 0.995         | 0.984 | 0.098        | 0.023 |
| Estonia                         | 0.879                           | 0.999         | 0.996 | 0.051        | 0.009 |
| Finland                         | 0.820                           | 0.985         | 0.956 | <b>0.121</b> | 0.028 |
| France                          | 0.826                           | 0.995         | 0.986 | 0.075        | 0.013 |
| Hungary                         | 0.889                           | 0.997         | 0.991 | 0.083        | 0.013 |
| Iceland                         | 0.874                           | 0.998         | 0.994 | 0.078        | 0.014 |
| Israel                          | 0.915                           | 0.999         | 0.998 | 0.056        | 0.007 |
| Italy                           | 0.869                           | 0.991         | 0.974 | <b>0.134</b> | 0.022 |
| Japan                           | 0.855                           | 0.991         | 0.974 | <b>0.132</b> | 0.022 |
| Kazakhstan                      | 0.892                           | 0.987         | 0.961 | <b>0.153</b> | 0.022 |
| Korea                           | 0.940                           | 0.997         | 0.991 | <b>0.179</b> | 0.015 |
| Kosovo                          | 0.914                           | 0.999         | 0.998 | 0.044        | 0.005 |
| Latvia                          | 0.883                           | 0.989         | 0.968 | <b>0.140</b> | 0.030 |
| Lithuania                       | 0.870                           | 0.989         | 0.966 | <b>0.170</b> | 0.031 |
| Malta                           | 0.888                           | 0.999         | 0.997 | 0.054        | 0.008 |
| Montenegro                      | 0.949                           | 0.996         | 0.989 | <b>0.197</b> | 0.020 |
| Morocco                         | 0.895                           | 0.999         | 0.998 | 0.035        | 0.005 |
| Netherlands                     | 0.817                           | 0.990         | 0.969 | 0.083        | 0.022 |
| New Zealand                     | 0.862                           | 0.999         | 0.998 | 0.041        | 0.010 |
| North Macedonia                 | 0.912                           | 0.994         | 0.983 | <b>0.167</b> | 0.018 |
| Norway                          | 0.871                           | 0.996         | 0.988 | <b>0.106</b> | 0.019 |
| Poland                          | 0.918                           | 0.998         | 0.993 | 0.082        | 0.012 |
| Portugal                        | 0.884                           | 0.999         | 0.996 | 0.060        | 0.010 |
| Romania                         | 0.895                           | 0.994         | 0.982 | <b>0.117</b> | 0.016 |
| Saudi Arabia                    | 0.965                           | 1.000         | 1.000 | 0.047        | 0.004 |
| Serbia                          | 0.913                           | 0.991         | 0.972 | <b>0.198</b> | 0.027 |
| Shanghai (China)                | 0.908                           | 1.000         | 1.000 | 0.032        | 0.003 |
| Singapore                       | 0.897                           | 1.000         | 1.000 | 0.020        | 0.004 |
| Slovak Republic                 | 0.887                           | 0.997         | 0.991 | 0.081        | 0.014 |
| Slovenia                        | 0.866                           | 0.987         | 0.962 | <b>0.170</b> | 0.033 |
| South Africa                    | 0.918                           | 0.999         | 0.997 | 0.081        | 0.009 |
| Spain                           | 0.882                           | 0.996         | 0.989 | 0.066        | 0.011 |
| Sweden                          | 0.832                           | 0.997         | 0.990 | 0.067        | 0.014 |
| Türkiye                         | 0.944                           | 0.998         | 0.995 | <b>0.123</b> | 0.010 |
| United Arab Emirates            | 0.930                           | 0.999         | 0.996 | 0.079        | 0.011 |
| United States                   | 0.894                           | 1.000         | 0.999 | 0.035        | 0.007 |
| Uzbekistan                      | 0.842                           | 0.999         | 0.998 | 0.042        | 0.007 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Viet Nam                        | 0.902                           | 0.999         | 0.998 | 0.071        | 0.009 |
| International pooled data       | 0.888                           | 0.997         | 0.991 | 0.088        | 0.012 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.900                           | 0.999         | 0.997 | 0.072        | 0.010 |
| Belgium                         | 0.814                           | 0.995         | 0.985 | 0.069        | 0.015 |
| Flemish Community (Belgium)     | 0.858                           | 0.996         | 0.988 | 0.089        | 0.018 |
| French Community (Belgium)      | 0.750                           | 0.992         | 0.975 | 0.064        | 0.016 |
| Brazil                          | 0.905                           | 0.999         | 0.998 | 0.050        | 0.006 |
| France                          | 0.841                           | 0.997         | 0.990 | 0.066        | 0.012 |
| Japan                           | 0.851                           | 0.997         | 0.991 | 0.079        | 0.015 |
| Korea                           | 0.952                           | 0.999         | 0.996 | <b>0.151</b> | 0.009 |
| Morocco                         | 0.884                           | 0.997         | 0.992 | 0.064        | 0.011 |
| Netherlands                     | 0.899                           | 0.991         | 0.973 | <b>0.198</b> | 0.033 |
| New Zealand                     | 0.909                           | 1.000         | 0.999 | 0.028        | 0.006 |
| Saudi Arabia                    | 0.960                           | 1.000         | 0.999 | 0.076        | 0.004 |
| Slovenia                        | 0.885                           | 0.996         | 0.987 | 0.100        | 0.016 |
| Spain                           | 0.888                           | 0.998         | 0.994 | 0.055        | 0.010 |
| Türkiye                         | 0.949                           | 0.998         | 0.995 | <b>0.136</b> | 0.011 |
| United Arab Emirates            | 0.931                           | 0.998         | 0.994 | <b>0.126</b> | 0.015 |
| International pooled data       | 0.894                           | 0.999         | 0.998 | 0.047        | 0.006 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.904                           | 0.984         | 0.951 | <b>0.226</b> | 0.031 |
| Denmark                         | 0.858                           | 0.989         | 0.967 | <b>0.151</b> | 0.029 |
| Flemish Community (Belgium)     | 0.859                           | 0.996         | 0.989 | 0.080        | 0.015 |
| Portugal                        | 0.871                           | 0.996         | 0.987 | 0.096        | 0.015 |
| Saudi Arabia                    | 0.961                           | 1.000         | 0.999 | 0.054        | 0.004 |
| Slovenia                        | 0.875                           | 0.993         | 0.978 | <b>0.128</b> | 0.023 |
| Türkiye                         | 0.942                           | 0.999         | 0.998 | 0.082        | 0.007 |
| United Arab Emirates            | 0.942                           | 0.998         | 0.995 | 0.085        | 0.009 |
| International pooled data       | 0.917                           | 0.997         | 0.990 | <b>0.115</b> | 0.015 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.138. Measurement invariance results from MGCFA for scale T4TLEAD with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.997     | 0.991 | 0.110 | 0.014 | -                       | -      | -       | -      |
| Equal loadings                | 0.992     | 0.990 | 0.115 | 0.030 | -0.005                  | -0.001 | 0.005   | 0.016  |
| Equal loadings and thresholds | 0.987     | 0.994 | 0.092 | 0.106 | -0.004                  | 0.004  | -0.023  | 0.076  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.139. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4TLEAD**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G64I | 0.866   | -2.041      | -0.916      | 0.804       |
| TT4G64J | 0.924   | -2.158      | -1.098      | 0.736       |
| TT4G64K | 0.842   | -2.134      | -1.111      | 0.741       |
| TT4G64L | 0.666   | -2.021      | -1.095      | 0.660       |

Source: OECD, TALIS 2024 database.

### Teacher-student relations (T4STUD)

The scale of *Teacher-student relations* (T4STUD) was measured by a set of four items: TT4G65A, TT4G65B, TT4G65C and TT4G65D. Teachers were asked to indicate their level of agreement with each of these items using the following response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale reflect more positive teacher-student relations. Table 11.140 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.141. The reliabilities for T4STUD are above 0.800 for most participating countries/territories, across all populations. As can be seen in Table 11.141, the scale T4STUD has a good model fit across all populations. The CFI, TLI and SRMR values are all within the established cut-off criteria. The RMSEA is also within the cut-off for most populations, with the exception of the ISCED level 2 population in Colombia, Korea, Portugal, Shanghai (China) and the United States; the ISCED level 1 population in Korea and Saudi Arabia; and the ISCED level 3 population in Croatia, Saudi Arabia and Türkiye.

Table 11.142 presents the results from the measurement invariance testing for T4STUD for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the RMSEA and SRMR and close for the CFI and TLI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for all fit indices but the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.143 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4STUD. All items show high loadings. Results by participating country/territory show a low loading for item TT4G65D in Sweden (ISCED level 2).

**Table 11.140. Items and response categories used in the construction of scale T4STUD**

| Scale or item | Question or item wording                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------|
| T4STUD        | How strongly do you agree or disagree with the following statements about what happens in this school?     |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i> |
|               | Scale mid-point: 2.5                                                                                       |
| TT4G65A       | Teachers and students usually get on well with each other.                                                 |
| TT4G65B       | Most teachers believe that the students' well-being is important.                                          |
| TT4G65C       | Most teachers are interested in what students have to say.                                                 |
| TT4G65D       | If a student needs extra assistance, the school provides it.                                               |

Source: OECD, TALIS 2024 database.

**Table 11.141. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4STUD**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.869            | 0.997         | 0.991 | 0.057        | 0.012 |
| Alberta (Canada)                | 0.915            | 1.000         | 0.999 | 0.040        | 0.011 |
| Australia                       | 0.897            | 0.999         | 0.997 | 0.057        | 0.012 |
| Austria                         | 0.829            | 1.000         | 0.999 | 0.019        | 0.006 |
| Azerbaijan                      | 0.829            | 0.999         | 0.997 | 0.028        | 0.006 |
| Bahrain                         | 0.905            | 0.998         | 0.995 | 0.066        | 0.006 |
| Belgium                         | 0.871            | 0.999         | 0.998 | 0.042        | 0.009 |
| Flemish Community (Belgium)     | 0.877            | 1.000         | 1.000 | 0.019        | 0.007 |
| French Community (Belgium)      | 0.853            | 0.995         | 0.985 | 0.097        | 0.018 |
| Brazil                          | 0.885            | 0.998         | 0.993 | 0.082        | 0.012 |
| Bulgaria                        | 0.915            | 0.999         | 0.998 | 0.046        | 0.008 |
| Chile                           | 0.881            | 0.999         | 0.997 | 0.035        | 0.008 |
| Colombia                        | 0.886            | 0.994         | 0.982 | <b>0.113</b> | 0.020 |
| Costa Rica                      | 0.876            | 0.999         | 0.998 | 0.037        | 0.007 |
| Croatia                         | 0.911            | 1.000         | 0.999 | 0.038        | 0.007 |
| Cyprus                          | 0.898            | 0.999         | 0.997 | 0.054        | 0.008 |
| Czechia                         | 0.892            | 0.996         | 0.988 | 0.091        | 0.017 |
| Denmark                         | 0.869            | 0.997         | 0.991 | 0.080        | 0.019 |
| Estonia                         | 0.890            | 1.000         | 0.999 | 0.031        | 0.006 |
| Finland                         | 0.866            | 1.000         | 1.000 | 0.016        | 0.006 |
| France                          | 0.843            | 0.997         | 0.990 | 0.085        | 0.019 |
| Hungary                         | 0.917            | 0.998         | 0.995 | 0.086        | 0.011 |
| Iceland                         | 0.871            | 1.000         | 1.000 | 0.025        | 0.009 |
| Israel                          | 0.891            | 0.999         | 0.997 | 0.054        | 0.010 |
| Italy                           | 0.885            | 0.997         | 0.992 | 0.088        | 0.013 |
| Japan                           | 0.925            | 0.999         | 0.996 | 0.089        | 0.010 |
| Kazakhstan                      | 0.890            | 1.000         | 0.999 | 0.020        | 0.003 |
| Korea                           | 0.941            | 0.997         | 0.992 | <b>0.143</b> | 0.013 |
| Kosovo                          | 0.881            | 0.994         | 0.983 | 0.097        | 0.016 |
| Latvia                          | 0.912            | 1.000         | 0.999 | 0.031        | 0.007 |
| Lithuania                       | 0.918            | 0.998         | 0.995 | 0.069        | 0.011 |
| Malta                           | 0.886            | 0.999         | 0.998 | 0.045        | 0.009 |
| Montenegro                      | 0.935            | 1.000         | 0.999 | 0.045        | 0.005 |
| Morocco                         | 0.829            | 0.989         | 0.966 | 0.086        | 0.018 |
| Netherlands                     | 0.864            | 1.000         | 1.002 | 0.000        | 0.001 |
| New Zealand                     | 0.915            | 1.000         | 0.999 | 0.030        | 0.009 |
| North Macedonia                 | 0.899            | 0.998         | 0.994 | 0.071        | 0.009 |
| Norway                          | 0.887            | 0.998         | 0.993 | 0.079        | 0.021 |
| Poland                          | 0.910            | 0.997         | 0.990 | 0.089        | 0.018 |
| Portugal                        | 0.863            | 0.995         | 0.985 | <b>0.101</b> | 0.022 |
| Romania                         | 0.914            | 0.997         | 0.992 | 0.083        | 0.014 |
| Saudi Arabia                    | 0.942            | 0.999         | 0.996 | 0.065        | 0.005 |
| Serbia                          | 0.905            | 1.000         | 0.999 | 0.027        | 0.005 |
| Shanghai (China)                | 0.962            | 0.997         | 0.992 | <b>0.220</b> | 0.015 |
| Singapore                       | 0.911            | 0.999         | 0.997 | 0.050        | 0.008 |
| Slovak Republic                 | 0.882            | 0.999         | 0.997 | 0.046        | 0.009 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Slovenia                        | 0.866                           | 0.999         | 0.997 | 0.040        | 0.010 |
| South Africa                    | 0.860                           | 1.000         | 1.001 | 0.000        | 0.001 |
| Spain                           | 0.875                           | 0.999         | 0.997 | 0.044        | 0.010 |
| Sweden                          | 0.812                           | 0.998         | 0.995 | 0.053        | 0.017 |
| Türkiye                         | 0.927                           | 0.999         | 0.997 | 0.082        | 0.008 |
| United Arab Emirates            | 0.927                           | 0.999         | 0.997 | 0.048        | 0.008 |
| United States                   | 0.904                           | 0.997         | 0.990 | <b>0.108</b> | 0.023 |
| Uzbekistan                      | 0.765                           | 0.992         | 0.976 | 0.067        | 0.016 |
| Viet Nam                        | 0.849                           | 0.994         | 0.981 | 0.100        | 0.016 |
| International pooled data       | 0.880                           | 0.998         | 0.995 | 0.054        | 0.008 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.923                           | 1.000         | 0.999 | 0.044        | 0.008 |
| Belgium                         | 0.900                           | 0.999         | 0.998 | 0.050        | 0.009 |
| Flemish Community (Belgium)     | 0.893                           | 0.999         | 0.997 | 0.069        | 0.015 |
| French Community (Belgium)      | 0.910                           | 0.998         | 0.994 | 0.088        | 0.014 |
| Brazil                          | 0.892                           | 0.998         | 0.994 | 0.069        | 0.009 |
| France                          | 0.913                           | 0.999         | 0.996 | 0.091        | 0.016 |
| Japan                           | 0.940                           | 1.000         | 0.999 | 0.045        | 0.007 |
| Korea                           | 0.951                           | 0.996         | 0.988 | <b>0.168</b> | 0.014 |
| Morocco                         | 0.847                           | 0.997         | 0.991 | 0.054        | 0.012 |
| Netherlands                     | 0.918                           | 1.000         | 1.000 | 0.016        | 0.012 |
| New Zealand                     | 0.910                           | 0.999         | 0.997 | 0.074        | 0.016 |
| Saudi Arabia                    | 0.952                           | 0.998         | 0.994 | <b>0.101</b> | 0.008 |
| Slovenia                        | 0.880                           | 0.999         | 0.997 | 0.044        | 0.009 |
| Spain                           | 0.908                           | 0.999         | 0.998 | 0.037        | 0.007 |
| Türkiye                         | 0.939                           | 0.999         | 0.996 | 0.092        | 0.010 |
| United Arab Emirates            | 0.921                           | 1.000         | 0.999 | 0.026        | 0.005 |
| International pooled data       | 0.913                           | 0.999         | 0.998 | 0.047        | 0.007 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.906                           | 0.997         | 0.991 | <b>0.101</b> | 0.016 |
| Denmark                         | 0.864                           | 0.999         | 0.997 | 0.042        | 0.012 |
| Flemish Community (Belgium)     | 0.883                           | 0.999         | 0.998 | 0.044        | 0.010 |
| Portugal                        | 0.876                           | 0.998         | 0.994 | 0.070        | 0.012 |
| Saudi Arabia                    | 0.955                           | 0.995         | 0.985 | <b>0.150</b> | 0.013 |
| Slovenia                        | 0.865                           | 0.998         | 0.993 | 0.066        | 0.014 |
| Türkiye                         | 0.923                           | 0.998         | 0.995 | <b>0.104</b> | 0.012 |
| United Arab Emirates            | 0.929                           | 0.992         | 0.977 | 0.060        | 0.009 |
| International pooled data       | 0.909                           | 0.999         | 0.996 | 0.059        | 0.009 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.142. Measurement invariance results from MGCFA for scale T4STUD with differences in model fits across models for ISCED level 2**

| Invariance model | Model fit |     |       |      | Difference in model fit |       |         |        |
|------------------|-----------|-----|-------|------|-------------------------|-------|---------|--------|
|                  | CFI       | TLI | RMSEA | SRMR | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |

| ISCED level 2                 |       |       |       |       |        |        |        |       |
|-------------------------------|-------|-------|-------|-------|--------|--------|--------|-------|
| Baseline                      | 0.998 | 0.994 | 0.075 | 0.011 | -      | -      | -      | -     |
| Equal loadings                | 0.991 | 0.990 | 0.103 | 0.028 | -0.007 | -0.005 | 0.028  | 0.018 |
| Equal loadings and thresholds | 0.988 | 0.994 | 0.079 | 0.115 | -0.004 | 0.004  | -0.024 | 0.086 |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), Iceland, the Netherlands, New Zealand, Norway and Sweden are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.143. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4STUD**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G65A | 0.771   | -2.531      | -1.707      | 0.534       |
| TT4G65B | 0.892   | -2.627      | -1.790      | 0.193       |
| TT4G65C | 0.876   | -2.501      | -1.448      | 0.489       |
| TT4G65D | 0.690   | -2.338      | -1.508      | 0.255       |

Source: OECD, TALIS 2024 database.

### Relational leadership (T4RELEAD)

The scale of *Relational leadership* (T4RELEAD) was measured by a set of four items (TT4G66A, TT4G66E, TT4G66F and TT4G66G), in which teachers were asked to indicate their level of agreement with different statements about the principal. For each item, the following response categories were available: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale reflect greater perceived relational leadership. Table 11.144 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.145. The reliabilities for T4RELEAD are above 0.700 in all populations. In terms of the model fit of the scale T4RELEAD, the CFI, TLI and SRMR are all within the acceptable cut-off criteria for all participants. However, the RMSEA exceeds the cut-off criterion in 22 of the ISCED level 2 participants, with half of these exceeding 0.120. The RMSEA also exceeds the cut-off in the ISCED level 1 population in Brazil, Korea, Morocco and Saudi Arabia, as well as in the ISCED level 3 population in Croatia, Portugal and Türkiye.

Table 11.146 presents the results from the measurement invariance testing results for T4RELEAD for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI, TLI and RMSEA and exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.147 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4RELEAD. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.144. Items and response categories used in the construction of scale T4RELEAD**

| Scale or item | Question or item wording                                                                                          |
|---------------|-------------------------------------------------------------------------------------------------------------------|
| T4RELEAD      | Thinking about the principal at this school, how strongly do you agree or disagree with the following statements? |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i>        |
|               | Scale mid-point: 2.5                                                                                              |

|         |                                                                              |
|---------|------------------------------------------------------------------------------|
| TT4G66A | The principal has a clear vision for this school.                            |
| TT4G66E | The principal encourages all staff to have a say on important decisions.     |
| TT4G66F | The principal has good professional relationships with staff.                |
| TT4G66G | The principal has good professional relationships with parents or guardians. |

Source: OECD, TALIS 2024 database.

**Table 11.145. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4RELEAD**

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                                 |               |       |              |       |
| Albania                         | 0.951                           | 1.000         | 0.999 | 0.034        | 0.004 |
| Alberta (Canada)                | 0.947                           | 0.998         | 0.995 | 0.096        | 0.012 |
| Australia                       | 0.931                           | 0.999         | 0.997 | 0.094        | 0.011 |
| Austria                         | 0.892                           | 0.998         | 0.995 | 0.066        | 0.010 |
| Azerbaijan                      | 0.922                           | 0.998         | 0.994 | 0.084        | 0.008 |
| Bahrain                         | 0.949                           | 0.997         | 0.990 | <b>0.164</b> | 0.013 |
| Belgium                         | 0.904                           | 0.998         | 0.994 | 0.075        | 0.011 |
| Flemish Community (Belgium)     | 0.901                           | 0.998         | 0.994 | 0.078        | 0.012 |
| French Community (Belgium)      | 0.907                           | 0.998         | 0.995 | 0.073        | 0.010 |
| Brazil                          | 0.945                           | 0.998         | 0.995 | <b>0.157</b> | 0.016 |
| Bulgaria                        | 0.966                           | 1.000         | 0.999 | 0.056        | 0.004 |
| Chile                           | 0.932                           | 0.999         | 0.997 | 0.059        | 0.008 |
| Colombia                        | 0.931                           | 0.998         | 0.994 | 0.098        | 0.014 |
| Costa Rica                      | 0.945                           | 0.996         | 0.988 | <b>0.169</b> | 0.018 |
| Croatia                         | 0.952                           | 0.999         | 0.996 | <b>0.117</b> | 0.009 |
| Cyprus                          | 0.917                           | 0.996         | 0.987 | <b>0.123</b> | 0.014 |
| Czechia                         | 0.920                           | 0.997         | 0.991 | <b>0.107</b> | 0.013 |
| Denmark                         | 0.920                           | 0.998         | 0.995 | 0.100        | 0.013 |
| Estonia                         | 0.923                           | 0.997         | 0.992 | <b>0.110</b> | 0.014 |
| Finland                         | 0.929                           | 1.000         | 0.999 | 0.038        | 0.005 |
| France                          | 0.916                           | 0.998         | 0.993 | 0.099        | 0.011 |
| Hungary                         | 0.953                           | 1.000         | 1.000 | 0.045        | 0.004 |
| Iceland                         | 0.932                           | 0.998         | 0.995 | 0.099        | 0.010 |
| Israel                          | 0.927                           | 0.999         | 0.996 | 0.071        | 0.010 |
| Italy                           | 0.933                           | 0.998         | 0.995 | <b>0.112</b> | 0.012 |
| Japan                           | 0.917                           | 0.999         | 0.997 | 0.084        | 0.010 |
| Kazakhstan                      | 0.943                           | 1.000         | 0.999 | 0.047        | 0.006 |
| Korea                           | 0.954                           | 0.999         | 0.997 | <b>0.114</b> | 0.007 |
| Kosovo                          | 0.943                           | 0.998         | 0.995 | <b>0.114</b> | 0.012 |
| Latvia                          | 0.949                           | 0.999         | 0.998 | 0.059        | 0.009 |
| Lithuania                       | 0.939                           | 0.999         | 0.998 | 0.057        | 0.007 |
| Malta                           | 0.924                           | 0.998         | 0.993 | <b>0.112</b> | 0.014 |



| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Montenegro                      | 0.975                           | 1.000         | 1.000 | 0.050        | 0.003 |
| Morocco                         | 0.951                           | 0.996         | 0.988 | <b>0.143</b> | 0.015 |
| Netherlands                     | 0.840                           | 0.997         | 0.990 | 0.064        | 0.017 |
| New Zealand                     | 0.907                           | 0.998         | 0.993 | 0.094        | 0.017 |
| North Macedonia                 | 0.967                           | 1.000         | 0.999 | 0.078        | 0.005 |
| Norway                          | 0.936                           | 0.996         | 0.988 | <b>0.135</b> | 0.015 |
| Poland                          | 0.941                           | 0.997         | 0.991 | <b>0.128</b> | 0.013 |
| Portugal                        | 0.930                           | 0.997         | 0.991 | <b>0.120</b> | 0.016 |
| Romania                         | 0.966                           | 0.999         | 0.997 | <b>0.106</b> | 0.008 |
| Saudi Arabia                    | 0.970                           | 0.999         | 0.996 | <b>0.127</b> | 0.008 |
| Serbia                          | 0.960                           | 0.998         | 0.995 | <b>0.153</b> | 0.011 |
| Shanghai (China)                | 0.979                           | 1.000         | 0.999 | <b>0.151</b> | 0.007 |
| Singapore                       | 0.940                           | 1.000         | 0.999 | 0.050        | 0.007 |
| Slovak Republic                 | 0.934                           | 0.999         | 0.997 | 0.083        | 0.010 |
| Slovenia                        | 0.929                           | 0.999         | 0.996 | 0.081        | 0.009 |
| South Africa                    | 0.948                           | 1.000         | 0.999 | 0.042        | 0.005 |
| Spain                           | 0.939                           | 0.998         | 0.994 | 0.091        | 0.012 |
| Sweden                          | 0.910                           | 0.997         | 0.991 | <b>0.115</b> | 0.017 |
| Türkiye                         | 0.958                           | 0.998         | 0.995 | <b>0.132</b> | 0.008 |
| United Arab Emirates            | 0.955                           | 0.999         | 0.998 | 0.071        | 0.008 |
| United States                   | 0.946                           | 0.999         | 0.997 | 0.075        | 0.010 |
| Uzbekistan                      | 0.940                           | 1.000         | 1.000 | 0.000        | 0.001 |
| Viet Nam                        | 0.957                           | 0.999         | 0.998 | 0.084        | 0.007 |
| International pooled data       | 0.939                           | 0.999         | 0.996 | 0.086        | 0.009 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.938                           | 0.999         | 0.996 | 0.095        | 0.010 |
| Belgium                         | 0.919                           | 0.998         | 0.995 | 0.078        | 0.012 |
| Flemish Community (Belgium)     | 0.909                           | 0.998         | 0.994 | 0.089        | 0.014 |
| French Community (Belgium)      | 0.935                           | 0.999         | 0.998 | 0.063        | 0.007 |
| Brazil                          | 0.942                           | 0.996         | 0.988 | <b>0.193</b> | 0.020 |
| France                          | 0.948                           | 0.999         | 0.998 | 0.061        | 0.007 |
| Japan                           | 0.916                           | 0.999         | 0.996 | 0.097        | 0.013 |
| Korea                           | 0.952                           | 0.997         | 0.991 | <b>0.178</b> | 0.016 |
| Morocco                         | 0.945                           | 0.996         | 0.988 | <b>0.136</b> | 0.014 |
| Netherlands                     | 0.905                           | 0.993         | 0.980 | <b>0.130</b> | 0.030 |
| New Zealand                     | 0.928                           | 0.999         | 0.998 | 0.062        | 0.011 |
| Saudi Arabia                    | 0.975                           | 1.000         | 0.999 | <b>0.106</b> | 0.007 |
| Slovenia                        | 0.932                           | 0.999         | 0.996 | 0.089        | 0.010 |
| Spain                           | 0.947                           | 0.998         | 0.995 | 0.076        | 0.010 |
| Türkiye                         | 0.966                           | 1.000         | 0.999 | 0.074        | 0.004 |
| United Arab Emirates            | 0.957                           | 0.999         | 0.997 | 0.077        | 0.008 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| International pooled data       | 0.940                           | 0.999         | 0.997 | 0.080        | 0.008 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.957                           | 0.998         | 0.995 | <b>0.156</b> | 0.011 |
| Denmark                         | 0.840                           | 0.996         | 0.989 | 0.066        | 0.016 |
| Flemish Community (Belgium)     | 0.888                           | 0.998         | 0.994 | 0.070        | 0.011 |
| Portugal                        | 0.932                           | 0.995         | 0.985 | <b>0.171</b> | 0.022 |
| Saudi Arabia                    | 0.972                           | 1.000         | 1.000 | 0.039        | 0.003 |
| Slovenia                        | 0.935                           | 0.999         | 0.996 | 0.083        | 0.010 |
| Türkiye                         | 0.960                           | 0.999         | 0.998 | <b>0.126</b> | 0.008 |
| United Arab Emirates            | 0.960                           | 0.999         | 0.998 | 0.084        | 0.009 |
| International pooled data       | 0.941                           | 0.999         | 0.997 | 0.067        | 0.007 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.146. Measurement invariance results from MGCFA for scale T4RELEAD with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |       |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|-------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.999     | 0.996 | 0.098 | 0.010 | -                       | -     | -       | -      |
| Equal loadings                | 0.997     | 0.997 | 0.094 | 0.017 | -0.001                  | 0.000 | -0.004  | 0.008  |
| Equal loadings and thresholds | 0.997     | 0.998 | 0.066 | 0.070 | -0.000                  | 0.002 | -0.028  | 0.053  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.147. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4RELEAD**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G66A | 0.849   | -1.996      | -1.264      | 0.235       |
| TT4G66E | 0.851   | -1.737      | -0.893      | 0.467       |
| TT4G66F | 0.968   | -1.931      | -1.238      | 0.253       |
| TT4G66G | 0.925   | -2.204      | -1.486      | 0.319       |

Source: OECD, TALIS 2024 database.

### Instructional leadership (T4INSTLE)

The scale of *Instructional leadership* (T4INSTLE) was measured by a set of three items: TT4G66B, TT4G66C and TT4G66D. Teachers were asked to indicate their level of agreement with each of these items using the following response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale reflect greater perceived instructional leadership. Table 11.148

provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.149. The fit indices for T4INSTLE are not presented here as the scale was measured by just three items. The reliabilities for T4INSTLE are above 0.700 in all populations.

Table 11.150 presents the results from the measurement invariance testing for T4INSTLE for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The model fit of the equal loadings model shows a good fit with the exception of the RMSEA. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI, TLI and RMSEA and exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.151 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4INSTLE. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.148. Items and response categories used in the construction of scale T4INSTLE**

| Scale or item | Question or item wording                                                                                          |
|---------------|-------------------------------------------------------------------------------------------------------------------|
| T4INSTLE      | Thinking about the principal at this school, how strongly do you agree or disagree with the following statements? |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i>        |
|               | Scale mid-point: 2.5                                                                                              |
| TT4G66B       | The principal encourages co-operation among teachers to develop new teaching practices.                           |
| TT4G66C       | The principal ensures that teachers take responsibility for improving their teaching skills.                      |
| TT4G66D       | The principal ensures that teachers feel responsible for their students' learning outcomes.                       |

Source: OECD, TALIS 2024 database.

**Table 11.149. Reliability coefficient alpha for single countries and pooled model for scale T4INSTLE**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.926                           |
| Alberta (Canada)                | 0.926                           |
| Australia                       | 0.914                           |
| Austria                         | 0.846                           |
| Azerbaijan                      | 0.929                           |
| Bahrain                         | 0.963                           |
| Belgium                         | 0.845                           |
| Flemish Community (Belgium)     | 0.875                           |
| French Community (Belgium)      | 0.811                           |
| Brazil                          | 0.933                           |
| Bulgaria                        | 0.958                           |
| Chile                           | 0.905                           |
| Colombia                        | 0.918                           |
| Costa Rica                      | 0.919                           |
| Croatia                         | 0.938                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Cyprus                          | 0.916                           |
| Czechia                         | 0.865                           |
| Denmark                         | 0.891                           |
| Estonia                         | 0.858                           |
| Finland                         | 0.861                           |
| France                          | 0.851                           |
| Hungary                         | 0.942                           |
| Iceland                         | 0.891                           |
| Israel                          | 0.920                           |
| Italy                           | 0.927                           |
| Japan                           | 0.913                           |
| Kazakhstan                      | 0.934                           |
| Korea                           | 0.966                           |
| Kosovo                          | 0.924                           |
| Latvia                          | 0.929                           |
| Lithuania                       | 0.914                           |
| Malta                           | 0.924                           |
| Montenegro                      | 0.961                           |
| Morocco                         | 0.930                           |
| Netherlands                     | 0.867                           |
| New Zealand                     | 0.910                           |
| North Macedonia                 | 0.955                           |
| Norway                          | 0.911                           |
| Poland                          | 0.948                           |
| Portugal                        | 0.908                           |
| Romania                         | 0.923                           |
| Saudi Arabia                    | 0.962                           |
| Serbia                          | 0.935                           |
| Shanghai (China)                | 0.983                           |
| Singapore                       | 0.928                           |
| Slovak Republic                 | 0.917                           |
| Slovenia                        | 0.892                           |
| South Africa                    | 0.937                           |
| Spain                           | 0.916                           |
| Sweden                          | 0.886                           |
| Türkiye                         | 0.970                           |
| United Arab Emirates            | 0.958                           |
| United States                   | 0.929                           |
| Uzbekistan                      | 0.930                           |
| Viet Nam                        | 0.960                           |
| International pooled data       | 0.921                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.919                           |
| Belgium                         | 0.871                           |
| Flemish Community (Belgium)     | 0.897                           |
| French Community (Belgium)      | 0.841                           |
| Brazil                          | 0.926                           |
| France                          | 0.880                           |
| Japan                           | 0.898                           |
| Korea                           | 0.980                           |
| Morocco                         | 0.935                           |
| Netherlands                     | 0.911                           |
| New Zealand                     | 0.932                           |
| Saudi Arabia                    | 0.966                           |
| Slovenia                        | 0.896                           |
| Spain                           | 0.914                           |
| Türkiye                         | 0.970                           |
| United Arab Emirates            | 0.963                           |
| International pooled data       | 0.921                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.944                           |
| Denmark                         | 0.879                           |
| Flemish Community (Belgium)     | 0.874                           |
| Portugal                        | 0.917                           |
| Saudi Arabia                    | 0.961                           |
| Slovenia                        | 0.902                           |
| Türkiye                         | 0.969                           |
| United Arab Emirates            | 0.963                           |
| International pooled data       | 0.938                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.150. Measurement invariance results from MGCFA for scale T4INSTLE with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.998     | 0.997 | 0.146 | 0.017 | -0.002                  | -0.003 | 0.146   | 0.017  |
| Equal loadings and thresholds | 0.998     | 0.999 | 0.073 | 0.085 | 0.000                   | 0.003  | -0.073  | 0.068  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.  
Source: OECD, TALIS 2024 database.

**Table 11.151. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4INSTLE**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G66B | 0.881   | -2.004      | -1.216      | 0.298       |
| TT4G66C | 0.974   | -2.056      | -1.202      | 0.407       |
| TT4G66D | 0.839   | -2.144      | -1.281      | 0.430       |

Source: OECD, TALIS 2024 database.

### School climate regarding bullying (T4CLIBUL)

Teachers answered four items measuring *School climate regarding bullying* (T4CLIBUL). These items were TT4G70A, TT4G70B, TT4G70C and TT4G70D. Teachers were asked to indicate their level of agreement with each of these items using the following response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale reflect a more positive school climate regarding bullying. Table 11.152 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.153. The scale T4CLIBUL has high reliability (above 0.700) in all populations. As can be observed from Table 11.153, the CFI, TLI and SRMR for T4CLIBUL are all within the acceptable cut-off criteria for all populations. The RMSEA is above the cut-off criterion in ten ISCED level 2 participants (Australia, Japan, Korea, New Zealand, Saudi Arabia, Shanghai (China), Türkiye, United States, Uzbekistan and Viet Nam), six ISCED level 1 participants (Australia, Brazil, Japan, Korea, New Zealand and Saudi Arabia) and in the ISCED level 3 population in Denmark, Slovenia and Türkiye.

Table 11.154 presents the results from the measurement invariance testing for T4CLIBUL for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the RMSEA and SRMR and close for the CFI and TLI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA and exceeds the cut-offs for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.155 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4CLIBUL. All items show high loadings. Results by participating country/territory show a low item loading for item TT4G70C in Morocco (ISCED level 1).

**Table 11.152. Items and response categories used in the construction of scale T4CLIBUL**

| Scale or item | Question or item wording                                                                                                                                                                                                                         |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4CLIBUL      | How strongly do you agree or disagree with the following statements about student bullying at this school?<br><i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i><br>Scale mid-point: 2.5 |
| TT4G70A       | Teachers at this school make it clear to students that bullying is not tolerated.                                                                                                                                                                |
| TT4G70B       | At this school, students tell teachers when other students are being bullied.                                                                                                                                                                    |
| TT4G70C       | There are adults at this school students could turn to if they had a personal problem.                                                                                                                                                           |
| TT4G70D       | The teachers at this school are genuinely concerned about the students.                                                                                                                                                                          |

Source: OECD, TALIS 2024 database.

**Table 11.153. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4CLIBUL**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.765            | 1.000         | 1.001 | 0.000        | 0.005 |
| Alberta (Canada)                | 0.875            | 0.994         | 0.981 | 0.084        | 0.023 |
| Australia                       | 0.832            | 0.984         | 0.952 | <b>0.133</b> | 0.033 |
| Austria                         | 0.795            | 0.994         | 0.983 | 0.051        | 0.015 |
| Azerbaijan                      | 0.861            | 0.995         | 0.985 | 0.082        | 0.013 |
| Bahrain                         | 0.905            | 0.996         | 0.987 | 0.089        | 0.009 |
| Belgium                         | 0.815            | 0.999         | 0.997 | 0.023        | 0.008 |
| Flemish Community (Belgium)     | 0.833            | 0.999         | 0.996 | 0.029        | 0.010 |
| French Community (Belgium)      | 0.789            | 1.000         | 0.999 | 0.010        | 0.007 |
| Brazil                          | 0.899            | 0.997         | 0.990 | 0.068        | 0.009 |
| Bulgaria                        | 0.847            | 1.000         | 0.999 | 0.019        | 0.006 |
| Chile                           | 0.919            | 1.000         | 0.999 | 0.015        | 0.005 |
| Colombia                        | 0.864            | 0.995         | 0.985 | 0.066        | 0.012 |
| Costa Rica                      | 0.894            | 1.000         | 0.999 | 0.021        | 0.005 |
| Croatia                         | 0.911            | 0.999         | 0.996 | 0.057        | 0.009 |
| Cyprus                          | 0.859            | 0.995         | 0.986 | 0.076        | 0.015 |
| Czechia                         | 0.875            | 0.999         | 0.997 | 0.037        | 0.009 |
| Denmark                         | 0.856            | 0.998         | 0.995 | 0.046        | 0.012 |
| Estonia                         | 0.849            | 0.995         | 0.986 | 0.077        | 0.017 |
| Finland                         | 0.792            | 0.992         | 0.977 | 0.075        | 0.022 |
| France                          | 0.838            | 0.999         | 0.997 | 0.030        | 0.011 |
| Hungary                         | 0.884            | 0.999         | 0.998 | 0.032        | 0.008 |
| Iceland                         | 0.835            | 1.000         | 1.001 | 0.000        | 0.008 |
| Israel                          | 0.865            | 0.990         | 0.971 | 0.088        | 0.020 |
| Italy                           | 0.846            | 0.998         | 0.995 | 0.045        | 0.010 |
| Japan                           | 0.910            | 0.993         | 0.979 | <b>0.137</b> | 0.025 |
| Kazakhstan                      | 0.796            | 0.989         | 0.966 | 0.078        | 0.017 |
| Korea                           | 0.937            | 0.993         | 0.979 | <b>0.196</b> | 0.014 |
| Kosovo                          | 0.815            | 0.995         | 0.985 | 0.061        | 0.014 |
| Latvia                          | 0.797            | 1.000         | 1.001 | 0.000        | 0.003 |
| Lithuania                       | 0.878            | 1.000         | 0.999 | 0.025        | 0.006 |
| Malta                           | 0.854            | 0.997         | 0.992 | 0.062        | 0.016 |
| Montenegro                      | 0.903            | 0.999         | 0.997 | 0.040        | 0.006 |
| Morocco                         | 0.825            | 0.996         | 0.988 | 0.038        | 0.009 |
| Netherlands                     | 0.809            | 1.000         | 1.007 | 0.000        | 0.005 |
| New Zealand                     | 0.854            | 0.986         | 0.957 | <b>0.112</b> | 0.030 |
| North Macedonia                 | 0.862            | 0.996         | 0.988 | 0.077        | 0.011 |
| Norway                          | 0.854            | 0.995         | 0.984 | 0.088        | 0.025 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Poland                          | 0.857                           | 0.998         | 0.995 | 0.033        | 0.010 |
| Portugal                        | 0.825                           | 0.994         | 0.983 | 0.064        | 0.017 |
| Romania                         | 0.890                           | 1.000         | 0.999 | 0.025        | 0.005 |
| Saudi Arabia                    | 0.924                           | 0.992         | 0.977 | <b>0.133</b> | 0.015 |
| Serbia                          | 0.875                           | 0.996         | 0.987 | 0.083        | 0.012 |
| Shanghai (China)                | 0.964                           | 0.998         | 0.994 | <b>0.133</b> | 0.008 |
| Singapore                       | 0.872                           | 0.999         | 0.996 | 0.049        | 0.014 |
| Slovak Republic                 | 0.835                           | 1.000         | 1.001 | 0.000        | 0.001 |
| Slovenia                        | 0.851                           | 0.998         | 0.994 | 0.052        | 0.014 |
| South Africa                    | 0.830                           | 0.989         | 0.968 | 0.089        | 0.022 |
| Spain                           | 0.851                           | 0.994         | 0.983 | 0.055        | 0.017 |
| Sweden                          | 0.829                           | 0.999         | 0.998 | 0.027        | 0.011 |
| Türkiye                         | 0.912                           | 0.995         | 0.984 | <b>0.104</b> | 0.011 |
| United Arab Emirates            | 0.910                           | 0.996         | 0.988 | 0.064        | 0.011 |
| United States                   | 0.879                           | 0.984         | 0.952 | <b>0.112</b> | 0.023 |
| Uzbekistan                      | 0.852                           | 0.990         | 0.969 | <b>0.110</b> | 0.018 |
| Viet Nam                        | 0.883                           | 0.996         | 0.987 | <b>0.105</b> | 0.013 |
| International pooled data       | 0.850                           | 0.996         | 0.989 | 0.053        | 0.010 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.890                           | 0.984         | 0.953 | <b>0.156</b> | 0.024 |
| Belgium                         | 0.836                           | 0.996         | 0.987 | 0.062        | 0.016 |
| Flemish Community (Belgium)     | 0.850                           | 0.992         | 0.977 | 0.089        | 0.024 |
| French Community (Belgium)      | 0.822                           | 0.998         | 0.994 | 0.040        | 0.012 |
| Brazil                          | 0.906                           | 0.994         | 0.981 | <b>0.105</b> | 0.011 |
| France                          | 0.883                           | 0.998         | 0.994 | 0.055        | 0.017 |
| Japan                           | 0.935                           | 0.997         | 0.992 | <b>0.108</b> | 0.019 |
| Korea                           | 0.956                           | 0.996         | 0.988 | <b>0.138</b> | 0.013 |
| Morocco                         | 0.797                           | 0.996         | 0.989 | 0.057        | 0.016 |
| Netherlands                     | 0.801                           | 0.968         | 0.903 | <b>0.141</b> | 0.054 |
| New Zealand                     | 0.894                           | 0.983         | 0.949 | <b>0.186</b> | 0.033 |
| Saudi Arabia                    | 0.927                           | 0.994         | 0.983 | <b>0.106</b> | 0.012 |
| Slovenia                        | 0.869                           | 0.998         | 0.995 | 0.053        | 0.011 |
| Spain                           | 0.886                           | 0.994         | 0.983 | 0.061        | 0.018 |
| Türkiye                         | 0.925                           | 0.998         | 0.995 | 0.069        | 0.007 |
| United Arab Emirates            | 0.895                           | 0.996         | 0.989 | 0.065        | 0.012 |
| International pooled data       | 0.870                           | 0.996         | 0.988 | 0.066        | 0.011 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.891                           | 1.000         | 0.999 | 0.023        | 0.005 |
| Denmark                         | 0.817                           | 0.975         | 0.925 | <b>0.135</b> | 0.038 |
| Flemish Community (Belgium)     | 0.778                           | 0.992         | 0.975 | 0.067        | 0.020 |
| Portugal                        | 0.820                           | 0.994         | 0.983 | 0.073        | 0.017 |



| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.913                           | 0.998         | 0.993 | 0.069        | 0.009 |
| Slovenia                        | 0.832                           | 0.981         | 0.942 | <b>0.109</b> | 0.021 |
| Türkiye                         | 0.901                           | 0.994         | 0.983 | <b>0.106</b> | 0.012 |
| United Arab Emirates            | 0.894                           | 0.998         | 0.994 | 0.051        | 0.010 |
| International pooled data       | 0.857                           | 0.992         | 0.975 | 0.089        | 0.016 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.154. Measurement invariance results from MGCFA for scale T4CLIBUL with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.997     | 0.991 | 0.068 | 0.012 | -                       | -      | -       | -      |
| Equal loadings                | 0.984     | 0.980 | 0.098 | 0.032 | -0.013                  | -0.010 | 0.030   | 0.020  |
| Equal loadings and thresholds | 0.958     | 0.979 | 0.102 | 0.124 | -0.026                  | -0.002 | 0.004   | 0.092  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand, Norway and Sweden are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.155. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4CLIBUL**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G70A | 0.816   | -2.367      | -1.841      | -0.306      |
| TT4G70B | 0.687   | -2.358      | -1.325      | 0.510       |
| TT4G70C | 0.772   | -2.314      | -1.725      | -0.038      |
| TT4G70D | 0.817   | -2.507      | -1.824      | -0.052      |

Source: OECD, TALIS 2024 database.

### Student harassment in school (T4STUHAR)

The scale of *Student harassment in school* (T4STUHAR) was measured by a set of three items: TT4G71A, TT4G71B and TT4G71C. Teachers were asked to indicate their level of agreement with each of these items using the following response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale reflect greater perceived student harassment in school. Table 11.156 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.157. The fit indices for T4STUHAR are not presented here as the scale was measured by just three items. The reliabilities for T4STUHAR are high, above 0.800, in all populations. In some participating countries/territories, it was not possible to assess reliability or model fit because not all items in the scale were administered. Specifically, this was the case for the ISCED level 2 population in Azerbaijan, Bahrain, Israel, Kazakhstan, Morocco, Singapore, Türkiye, the United Arab Emirates and Uzbekistan; the ISCED

level 1 population in Morocco, Türkiye and the United Arab Emirates; and the ISCED level 3 population in Türkiye and the United Arab Emirates. No scale scores are provided for these participating countries/territories.

Table 11.158 presents the results from the measurement invariance testing for T4STUHAR for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI, TLI and RMSEA and exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.159 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4STUHAR. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.156. Items and response categories used in the construction of scale T4STUHAR**

| Scale or item | Question or item wording                                                                                                                                                                      |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4STUHAR      | How strongly do you agree or disagree with the following statements about student harassment at this school?                                                                                  |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i>                                                                                    |
|               | Scale mid-point: 2.5                                                                                                                                                                          |
| TT4G71A       | Students at this school get teased about their clothing or physical appearance.                                                                                                               |
| TT4G71B       | Students at this school get put down because of their ethnicity.                                                                                                                              |
| TT4G71C       | Students at this school get teased about their gender expression and sexuality (e.g. comments about students not acting "masculine" or "feminine" enough, homophobic or transphobic remarks). |

Source: OECD, TALIS 2024 database.

**Table 11.157. Reliability coefficient alpha for single countries and pooled model for scale T4STUHAR**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.901                           |
| Alberta (Canada)                | 0.931                           |
| Australia                       | 0.882                           |
| Austria                         | 0.802                           |
| Azerbaijan                      | -                               |
| Bahrain                         | -                               |
| Belgium                         | 0.834                           |
| Flemish Community (Belgium)     | 0.829                           |
| French Community (Belgium)      | 0.842                           |
| Brazil                          | 0.920                           |
| Bulgaria                        | 0.908                           |
| Chile                           | 0.891                           |
| Colombia                        | 0.908                           |
| Costa Rica                      | 0.912                           |
| Croatia                         | 0.847                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Cyprus                          | 0.896                           |
| Czechia                         | 0.886                           |
| Denmark                         | 0.854                           |
| Estonia                         | 0.847                           |
| Finland                         | 0.819                           |
| France                          | 0.874                           |
| Hungary                         | 0.881                           |
| Iceland                         | 0.859                           |
| Israel                          | -                               |
| Italy                           | 0.888                           |
| Japan                           | 0.828                           |
| Kazakhstan                      | -                               |
| Korea                           | 0.884                           |
| Kosovo                          | 0.878                           |
| Latvia                          | 0.858                           |
| Lithuania                       | 0.879                           |
| Malta                           | 0.883                           |
| Montenegro                      | 0.903                           |
| Morocco                         | -                               |
| Netherlands                     | 0.874                           |
| New Zealand                     | 0.876                           |
| North Macedonia                 | 0.862                           |
| Norway                          | 0.891                           |
| Poland                          | 0.882                           |
| Portugal                        | 0.916                           |
| Romania                         | 0.902                           |
| Saudi Arabia                    | 0.935                           |
| Serbia                          | 0.863                           |
| Shanghai (China)                | 0.939                           |
| Singapore                       | -                               |
| Slovak Republic                 | 0.836                           |
| Slovenia                        | 0.814                           |
| South Africa                    | 0.904                           |
| Spain                           | 0.924                           |
| Sweden                          | 0.873                           |
| Türkiye                         | -                               |
| United Arab Emirates            | -                               |
| United States                   | 0.918                           |
| Uzbekistan                      | -                               |
| Viet Nam                        | 0.934                           |
| International pooled data       | 0.901                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.909                           |
| Belgium                         | 0.825                           |
| Flemish Community (Belgium)     | 0.816                           |
| French Community (Belgium)      | 0.841                           |
| Brazil                          | 0.921                           |
| France                          | 0.839                           |
| Japan                           | 0.853                           |
| Korea                           | 0.903                           |
| Morocco                         | -                               |
| Netherlands                     | 0.847                           |
| New Zealand                     | 0.904                           |
| Saudi Arabia                    | 0.949                           |
| Slovenia                        | 0.843                           |
| Spain                           | 0.930                           |
| Türkiye                         | -                               |
| United Arab Emirates            | -                               |
| International pooled data       | 0.882                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.899                           |
| Denmark                         | 0.914                           |
| Flemish Community (Belgium)     | 0.833                           |
| Portugal                        | 0.916                           |
| Saudi Arabia                    | 0.951                           |
| Slovenia                        | 0.903                           |
| Türkiye                         | -                               |
| United Arab Emirates            | -                               |
| International pooled data       | 0.914                           |

Note: Alberta (Canada), Azerbaijan, Bahrain, the Flemish Community (Belgium), the French Community (Belgium), Israel, Kazakhstan, Morocco, the Netherlands, New Zealand, Norway, Singapore, Türkiye, the United Arab Emirates and Uzbekistan are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), Morocco, the Netherlands, New Zealand, Türkiye and the United Arab Emirates are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium), Türkiye and the United Arab Emirates are excluded from the pooled ISCED level 3 model. The following participating countries/territories were excluded from this scale because not all scale items were administered: for ISCED level 2, Azerbaijan, Bahrain, Israel, Kazakhstan, Morocco, Singapore, Türkiye, the United Arab Emirates and Uzbekistan; for ISCED level 1, Morocco, Türkiye and the United Arab Emirates; for ISCED level 3, Türkiye and the United Arab Emirates.

Source: OECD, TALIS 2024 database.

**Table 11.158. Measurement invariance results from MGCFA for scale T4STUHAR with differences in model fits across models for ISCED level 2**

| Invariance model     | Model fit |     |       |      | Difference in model fit |       |         |        |
|----------------------|-----------|-----|-------|------|-------------------------|-------|---------|--------|
|                      | CFI       | TLI | RMSEA | SRMR | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b> |           |     |       |      |                         |       |         |        |

|                               |       |       |       |       |        |        |       |       |
|-------------------------------|-------|-------|-------|-------|--------|--------|-------|-------|
| Baseline                      | 1.000 | 1.000 | 0.000 | 0.000 | -      | -      | -     | -     |
| Equal loadings                | 0.997 | 0.995 | 0.084 | 0.011 | -0.003 | -0.005 | 0.084 | 0.011 |
| Equal loadings and thresholds | 0.988 | 0.995 | 0.087 | 0.094 | -0.009 | -0.000 | 0.003 | 0.083 |

Note: Alberta (Canada), Azerbaijan, Bahrain, the Flemish Community (Belgium), the French Community (Belgium), Israel, Kazakhstan, Morocco, the Netherlands, New Zealand, Norway, Singapore, Türkiye, the United Arab Emirates and Uzbekistan are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.159. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4STUHAR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G71A | 0.831   | -0.895      | 0.507       | 1.929       |
| TT4G71B | 0.883   | -0.499      | 0.946       | 2.053       |
| TT4G71C | 0.871   | -0.622      | 0.734       | 1.909       |

Source: OECD, TALIS 2024 database.

### Change fatigue (T4CHFAT)

Teachers were asked to answer four items measuring *Change fatigue* (T4CHFAT). These items were TT4G72B, TT4G72C, TT4G72D and TT4G72F. All items were answered on a four-point scale, with response categories of “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale indicate greater perceived fatigue related to changes in the school. Table 11.160 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.161. The reliabilities for T4CHFAT are high (above 0.700) in all populations. As can be observed from Table 11.161, the CFI, TLI and SRMR for T4CHFAT are all within the acceptable cut-off criteria for all participants. However, the RMSEA is above the cut-off criterion in 29 of the ISCED level 2 participants, 10 of the ISCED level 1 participants, and 6 of the ISCED level 3 participants. The RMSEA is particularly high in all three ISCED levels in Saudi Arabia, as well as in the ISCED level 1 population in France and the ISCED level 2 population in Shanghai (China).

Table 11.162 presents the results from the measurement invariance testing for T4CHFAT for the ISCED level 2 population. The baseline model shows an acceptable model fit with the exception of the RMSEA. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI, TLI and RMSEA and exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.163 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4CHFAT. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.160. Items and response categories used in the construction of scale T4CHFAT**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                                                        |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4CHFAT       | How strongly do you agree or disagree with the following statements about changes in this school, regardless of whether these were initiated by the school or externally?<br><i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i><br>Scale mid-point: 2.5 |
| TT4G72B       | I am tired of all the changes in this school.                                                                                                                                                                                                                                                                   |

| Scale or item | Question or item wording                                                    |
|---------------|-----------------------------------------------------------------------------|
| TT4G72C       | We are asked to change too many things in this school.                      |
| TT4G72D       | It feels like we are always being asked to change something around here.    |
| TT4G72F       | I am asked to implement change initiatives without the necessary resources. |

Source: OECD, TALIS 2024 database.

**Table 11.161. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4CHFAT**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 2                   |                  |               |       |       |       |
| Albania                         | 0.834            | 0.989         | 0.967 | 0.115 | 0.022 |
| Alberta (Canada)                | 0.952            | 0.999         | 0.998 | 0.121 | 0.011 |
| Australia                       | 0.952            | 1.000         | 0.999 | 0.094 | 0.006 |
| Austria                         | 0.922            | 0.999         | 0.997 | 0.092 | 0.010 |
| Azerbaijan                      | 0.889            | 0.999         | 0.997 | 0.049 | 0.005 |
| Bahrain                         | 0.904            | 0.994         | 0.983 | 0.177 | 0.019 |
| Belgium                         | 0.930            | 1.000         | 0.999 | 0.071 | 0.006 |
| Flemish Community (Belgium)     | 0.930            | 1.000         | 0.999 | 0.087 | 0.008 |
| French Community (Belgium)      | 0.938            | 1.000         | 1.000 | 0.032 | 0.003 |
| Brazil                          | 0.939            | 0.999         | 0.998 | 0.087 | 0.006 |
| Bulgaria                        | 0.946            | 0.998         | 0.995 | 0.132 | 0.012 |
| Chile                           | 0.925            | 0.999         | 0.996 | 0.099 | 0.010 |
| Colombia                        | 0.899            | 1.000         | 1.000 | 0.000 | 0.002 |
| Costa Rica                      | 0.918            | 1.000         | 1.000 | 0.000 | 0.001 |
| Croatia                         | 0.947            | 0.999         | 0.998 | 0.104 | 0.007 |
| Cyprus                          | 0.901            | 0.998         | 0.994 | 0.140 | 0.018 |
| Czechia                         | 0.940            | 0.998         | 0.995 | 0.145 | 0.010 |
| Denmark                         | 0.955            | 1.000         | 0.999 | 0.106 | 0.008 |
| Estonia                         | 0.934            | 1.000         | 1.000 | 0.038 | 0.003 |
| Finland                         | 0.940            | 1.000         | 1.000 | 0.045 | 0.004 |
| France                          | 0.942            | 0.999         | 0.998 | 0.173 | 0.012 |
| Hungary                         | 0.941            | 0.997         | 0.992 | 0.193 | 0.014 |
| Iceland                         | 0.946            | 1.000         | 0.999 | 0.140 | 0.008 |
| Israel                          | 0.906            | 0.992         | 0.975 | 0.174 | 0.020 |
| Italy                           | 0.938            | 0.999         | 0.996 | 0.156 | 0.011 |
| Japan                           | 0.909            | 0.997         | 0.991 | 0.125 | 0.011 |
| Kazakhstan                      | 0.913            | 0.998         | 0.995 | 0.084 | 0.010 |
| Korea                           | 0.944            | 0.999         | 0.997 | 0.142 | 0.009 |
| Kosovo                          | 0.814            | 0.970         | 0.911 | 0.188 | 0.036 |
| Latvia                          | 0.941            | 0.999         | 0.996 | 0.109 | 0.011 |
| Lithuania                       | 0.941            | 0.999         | 0.998 | 0.070 | 0.007 |
| Malta                           | 0.960            | 1.000         | 1.000 | 0.055 | 0.003 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Montenegro                      | 0.926                           | 0.997         | 0.992 | <b>0.173</b> | 0.014 |
| Morocco                         | 0.815                           | 0.988         | 0.963 | <b>0.109</b> | 0.027 |
| Netherlands                     | 0.906                           | 1.000         | 1.000 | 0.000        | 0.004 |
| New Zealand                     | 0.941                           | 1.000         | 0.999 | <b>0.103</b> | 0.009 |
| North Macedonia                 | 0.899                           | 0.998         | 0.994 | 0.082        | 0.008 |
| Norway                          | 0.932                           | 0.999         | 0.996 | <b>0.143</b> | 0.014 |
| Poland                          | 0.963                           | 0.999         | 0.997 | <b>0.115</b> | 0.007 |
| Portugal                        | 0.950                           | 1.000         | 1.000 | 0.000        | 0.001 |
| Romania                         | 0.941                           | 0.999         | 0.998 | 0.095        | 0.009 |
| Saudi Arabia                    | 0.906                           | 0.988         | 0.965 | <b>0.232</b> | 0.024 |
| Serbia                          | 0.922                           | 0.999         | 0.996 | <b>0.106</b> | 0.010 |
| Shanghai (China)                | 0.909                           | 0.990         | 0.970 | <b>0.248</b> | 0.026 |
| Singapore                       | 0.939                           | 1.000         | 1.000 | 0.017        | 0.003 |
| Slovak Republic                 | 0.922                           | 0.999         | 0.998 | 0.066        | 0.008 |
| Slovenia                        | 0.936                           | 1.000         | 0.999 | 0.057        | 0.005 |
| South Africa                    | 0.900                           | 0.998         | 0.994 | 0.088        | 0.009 |
| Spain                           | 0.945                           | 0.999         | 0.997 | <b>0.103</b> | 0.007 |
| Sweden                          | 0.928                           | 0.999         | 0.997 | 0.089        | 0.009 |
| Türkiye                         | 0.927                           | 0.999         | 0.997 | 0.095        | 0.009 |
| United Arab Emirates            | 0.916                           | 0.990         | 0.971 | <b>0.173</b> | 0.022 |
| United States                   | 0.958                           | 0.999         | 0.998 | <b>0.112</b> | 0.011 |
| Uzbekistan                      | 0.863                           | 1.000         | 1.000 | 0.000        | 0.002 |
| Viet Nam                        | 0.912                           | 0.997         | 0.992 | <b>0.123</b> | 0.009 |
| International pooled data       | 0.922                           | 0.999         | 0.997 | 0.077        | 0.007 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.961                           | 1.000         | 0.999 | <b>0.102</b> | 0.005 |
| Belgium                         | 0.940                           | 1.000         | 0.999 | 0.090        | 0.007 |
| Flemish Community (Belgium)     | 0.928                           | 1.000         | 0.999 | 0.062        | 0.006 |
| French Community (Belgium)      | 0.953                           | 0.999         | 0.998 | <b>0.130</b> | 0.008 |
| Brazil                          | 0.928                           | 1.000         | 1.000 | 0.000        | 0.001 |
| France                          | 0.950                           | 0.998         | 0.993 | <b>0.261</b> | 0.018 |
| Japan                           | 0.911                           | 0.997         | 0.991 | <b>0.108</b> | 0.010 |
| Korea                           | 0.942                           | 0.998         | 0.993 | <b>0.163</b> | 0.011 |
| Morocco                         | 0.822                           | 0.995         | 0.985 | 0.087        | 0.020 |
| Netherlands                     | 0.866                           | 0.989         | 0.968 | <b>0.159</b> | 0.023 |
| New Zealand                     | 0.951                           | 0.999         | 0.998 | <b>0.152</b> | 0.010 |
| Saudi Arabia                    | 0.916                           | 0.992         | 0.976 | <b>0.197</b> | 0.018 |
| Slovenia                        | 0.941                           | 1.000         | 1.000 | 0.045        | 0.004 |
| Spain                           | 0.952                           | 0.999         | 0.996 | <b>0.133</b> | 0.011 |
| Türkiye                         | 0.929                           | 1.000         | 0.999 | 0.045        | 0.005 |
| United Arab Emirates            | 0.913                           | 0.991         | 0.974 | <b>0.178</b> | 0.025 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| International pooled data       | 0.922                           | 0.999         | 0.996 | 0.091        | 0.009 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.938                           | 0.999         | 0.997 | <b>0.131</b> | 0.010 |
| Denmark                         | 0.941                           | 0.999         | 0.998 | <b>0.107</b> | 0.011 |
| Flemish Community (Belgium)     | 0.923                           | 1.000         | 1.000 | 0.008        | 0.002 |
| Portugal                        | 0.941                           | 1.000         | 1.000 | 0.050        | 0.004 |
| Saudi Arabia                    | 0.913                           | 0.988         | 0.965 | <b>0.268</b> | 0.027 |
| Slovenia                        | 0.947                           | 0.999         | 0.998 | <b>0.106</b> | 0.007 |
| Türkiye                         | 0.927                           | 0.999         | 0.998 | 0.084        | 0.007 |
| United Arab Emirates            | 0.917                           | 0.985         | 0.956 | <b>0.191</b> | 0.022 |
| International pooled data       | 0.928                           | 0.999         | 0.996 | <b>0.108</b> | 0.010 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.162. Measurement invariance results from MGCFA for scale T4CHFAT with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |       |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|-------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.999     | 0.996 | 0.121 | 0.011 | -                       | -     | -       | -      |
| Equal loadings                | 0.998     | 0.997 | 0.105 | 0.023 | -0.001                  | 0.001 | -0.016  | 0.012  |
| Equal loadings and thresholds | 0.996     | 0.998 | 0.094 | 0.095 | -0.002                  | 0.001 | -0.011  | 0.071  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.163. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4CHFAT**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G72B | 0.840   | -0.831      | 0.906       | 1.725       |
| TT4G72C | 0.940   | -1.015      | 0.737       | 1.724       |
| TT4G72D | 0.944   | -0.984      | 0.648       | 1.683       |
| TT4G72F | 0.736   | -0.948      | 0.577       | 1.499       |

Source: OECD, TALIS 2024 database.

### Personal utility motivations to teach (T4MOPU)

Teachers answered three items measuring their *Personal utility motivations to teach* (T4MOPU). These items were TT4G73B, TT4G73C and TT4G73D. For each item, teachers could choose one of the following response categories: “Not important at all”, “Of low importance”, “Of moderate importance” and “Of high importance”. Higher values on this scale indicate a higher importance given to personal utility motivations.



Table 11.164 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.165. The model fit indices for T4MOPU are not presented here as the scale was measured by just three items. The reliabilities for T4MOPU are high (above 0.700) in all populations.

Table 11.166 presents the results from the measurement invariance testing for T4MOPU for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the RMSEA, close to the cut-off for the TLI and exceeds the cut-offs for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.167 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4MOPU. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.164. Items and response categories used in the construction of scale T4MOPU**

| Scale or item | Question or item wording                                                                                                                    |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| T4MOPU        | How important are the following factors for you as a teacher?                                                                               |
|               | <i>Recoded response categories for scaling: 1=Not important at all; 2=Of low importance; 3=Of moderate importance; 4=Of high importance</i> |
|               | Scale mid-point: 2.5                                                                                                                        |
| TT4G73B       | Teaching is a secure job.                                                                                                                   |
| TT4G73C       | Working hours fit with my family responsibilities.                                                                                          |
| TT4G73D       | Teaching has commitment flexibility (travel, part-time, family commitments).                                                                |

Source: OECD, TALIS 2024 database.

**Table 11.165. Reliability coefficient alpha for single countries and pooled model for scale T4MOPU**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.750                           |
| Alberta (Canada)                | 0.800                           |
| Australia                       | 0.818                           |
| Austria                         | 0.822                           |
| Azerbaijan                      | 0.810                           |
| Bahrain                         | 0.846                           |
| Belgium                         | 0.783                           |
| Flemish Community (Belgium)     | 0.786                           |
| French Community (Belgium)      | 0.789                           |
| Brazil                          | 0.794                           |
| Bulgaria                        | 0.787                           |
| Chile                           | 0.851                           |
| Colombia                        | 0.834                           |
| Costa Rica                      | 0.823                           |
| Croatia                         | 0.783                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Cyprus                          | 0.754                           |
| Czechia                         | 0.751                           |
| Denmark                         | 0.744                           |
| Estonia                         | 0.800                           |
| Finland                         | 0.755                           |
| France                          | 0.779                           |
| Hungary                         | 0.838                           |
| Iceland                         | 0.835                           |
| Israel                          | 0.855                           |
| Italy                           | 0.822                           |
| Japan                           | 0.781                           |
| Kazakhstan                      | 0.735                           |
| Korea                           | 0.850                           |
| Kosovo                          | 0.800                           |
| Latvia                          | 0.806                           |
| Lithuania                       | 0.805                           |
| Malta                           | 0.813                           |
| Montenegro                      | 0.801                           |
| Morocco                         | 0.823                           |
| Netherlands                     | 0.746                           |
| New Zealand                     | 0.773                           |
| North Macedonia                 | 0.807                           |
| Norway                          | 0.790                           |
| Poland                          | 0.798                           |
| Portugal                        | 0.789                           |
| Romania                         | 0.840                           |
| Saudi Arabia                    | 0.861                           |
| Serbia                          | 0.827                           |
| Shanghai (China)                | 0.878                           |
| Singapore                       | 0.813                           |
| Slovak Republic                 | 0.799                           |
| Slovenia                        | 0.833                           |
| South Africa                    | 0.816                           |
| Spain                           | 0.833                           |
| Sweden                          | 0.813                           |
| Türkiye                         | 0.861                           |
| United Arab Emirates            | 0.833                           |
| United States                   | 0.831                           |
| Uzbekistan                      | 0.755                           |
| Viet Nam                        | 0.815                           |
| International pooled data       | 0.811                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.835                           |
| Belgium                         | 0.789                           |
| Flemish Community (Belgium)     | 0.796                           |
| French Community (Belgium)      | 0.781                           |
| Brazil                          | 0.763                           |
| France                          | 0.761                           |
| Japan                           | 0.779                           |
| Korea                           | 0.872                           |
| Morocco                         | 0.818                           |
| Netherlands                     | 0.781                           |
| New Zealand                     | 0.800                           |
| Saudi Arabia                    | 0.854                           |
| Slovenia                        | 0.847                           |
| Spain                           | 0.848                           |
| Türkiye                         | 0.843                           |
| United Arab Emirates            | 0.819                           |
| International pooled data       | 0.819                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.816                           |
| Denmark                         | 0.798                           |
| Flemish Community (Belgium)     | 0.767                           |
| Portugal                        | 0.776                           |
| Saudi Arabia                    | 0.853                           |
| Slovenia                        | 0.793                           |
| Türkiye                         | 0.842                           |
| United Arab Emirates            | 0.853                           |
| International pooled data       | 0.812                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is from the pooled ISCED level 3 model. Source: OECD, TALIS 2024 database.

**Table 11.166. Measurement invariance results from MGCFA for scale T4MOPU with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.994     | 0.991 | 0.062 | 0.016 | -0.006                  | -0.009 | 0.062   | 0.016  |
| Equal loadings and thresholds | 0.949     | 0.978 | 0.100 | 0.083 | -0.045                  | -0.013 | 0.037   | 0.067  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.  
Source: OECD, TALIS 2024 database.

**Table 11.167. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4MOPU**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G73B | 0.651   | -2.057      | -1.277      | -0.111      |
| TT4G73C | 0.886   | -1.931      | -1.248      | -0.159      |
| TT4G73D | 0.786   | -1.676      | -0.876      | 0.201       |

Source: OECD, TALIS 2024 database.

### Social utility motivations to teach (T4MOSU)

The scale of *Social utility motivations to teach* (T4MOSU) was measured by a set of three items: TT4G73E, TT4G73F and TT4G73G. For each item, teachers had to indicate the importance of different factors, using the following response categories: “Not important at all”, “Of low importance”, “Of moderate importance” and “Of high importance”. Higher values on this scale indicate a higher importance given to social utility motivations. Table 11.168 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.169. The model fit indices for T4MOSU are not presented here as the scale was measured by just three items. The scale T4MOSU has high reliability (above 0.700) in all populations.

Table 11.170 presents the results from the measurement invariance testing for T4MOSU for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA and close for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.171 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4MOSU. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.168. Items and response categories used in the construction of scale T4MOSU**

| Scale or item | Question or item wording                                                                                                                                                                                                             |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4MOSU        | How important are the following factors for you as a teacher?<br><i>Recoded response categories for scaling: 1=Not important at all; 2=Of low importance; 3=Of moderate importance; 4=Of high importance</i><br>Scale mid-point: 2.5 |
| TT4G73E       | Teaching allows me to influence the next generation.                                                                                                                                                                                 |
| TT4G73F       | Teaching allows me to work against social disadvantage.                                                                                                                                                                              |
| TT4G73G       | Teaching makes a worthwhile social contribution.                                                                                                                                                                                     |

Source: OECD, TALIS 2024 database.

Table 11.169. Reliability coefficient alpha for single countries and pooled model for scale T4MOSU

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.752                           |
| Alberta (Canada)                | 0.844                           |
| Australia                       | 0.867                           |
| Austria                         | 0.847                           |
| Azerbaijan                      | 0.853                           |
| Bahrain                         | 0.853                           |
| Belgium                         | 0.820                           |
| Flemish Community (Belgium)     | 0.834                           |
| French Community (Belgium)      | 0.846                           |
| Brazil                          | 0.922                           |
| Bulgaria                        | 0.856                           |
| Chile                           | 0.915                           |
| Colombia                        | 0.903                           |
| Costa Rica                      | 0.869                           |
| Croatia                         | 0.901                           |
| Cyprus                          | 0.883                           |
| Czechia                         | 0.860                           |
| Denmark                         | 0.836                           |
| Estonia                         | 0.883                           |
| Finland                         | 0.872                           |
| France                          | 0.859                           |
| Hungary                         | 0.878                           |
| Iceland                         | 0.889                           |
| Israel                          | 0.875                           |
| Italy                           | 0.838                           |
| Japan                           | 0.861                           |
| Kazakhstan                      | 0.814                           |
| Korea                           | 0.858                           |
| Kosovo                          | 0.777                           |
| Latvia                          | 0.903                           |
| Lithuania                       | 0.900                           |
| Malta                           | 0.898                           |
| Montenegro                      | 0.925                           |
| Morocco                         | 0.855                           |
| Netherlands                     | 0.847                           |
| New Zealand                     | 0.821                           |
| North Macedonia                 | 0.841                           |
| Norway                          | 0.898                           |
| Poland                          | 0.892                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Portugal                        | 0.848                           |
| Romania                         | 0.886                           |
| Saudi Arabia                    | 0.896                           |
| Serbia                          | 0.884                           |
| Shanghai (China)                | 0.803                           |
| Singapore                       | 0.889                           |
| Slovak Republic                 | 0.876                           |
| Slovenia                        | 0.856                           |
| South Africa                    | 0.888                           |
| Spain                           | 0.884                           |
| Sweden                          | 0.903                           |
| Türkiye                         | 0.900                           |
| United Arab Emirates            | 0.863                           |
| United States                   | 0.872                           |
| Uzbekistan                      | 0.828                           |
| Viet Nam                        | 0.841                           |
| International pooled data       | 0.863                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.863                           |
| Belgium                         | 0.845                           |
| Flemish Community (Belgium)     | 0.862                           |
| French Community (Belgium)      | 0.865                           |
| Brazil                          | 0.898                           |
| France                          | 0.866                           |
| Japan                           | 0.894                           |
| Korea                           | 0.869                           |
| Morocco                         | 0.835                           |
| Netherlands                     | 0.864                           |
| New Zealand                     | 0.857                           |
| Saudi Arabia                    | 0.895                           |
| Slovenia                        | 0.849                           |
| Spain                           | 0.898                           |
| Türkiye                         | 0.881                           |
| United Arab Emirates            | 0.842                           |
| International pooled data       | 0.868                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.896                           |
| Denmark                         | 0.819                           |
| Flemish Community (Belgium)     | 0.842                           |
| Portugal                        | 0.873                           |
| Saudi Arabia                    | 0.900                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Slovenia                        | 0.845                           |
| Türkiye                         | 0.893                           |
| United Arab Emirates            | 0.868                           |
| International pooled data       | 0.868                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.170. Measurement invariance results from MGCFA for scale T4MOSU with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.994     | 0.991 | 0.073 | 0.016 | -0.006                  | -0.009 | 0.073   | 0.016  |
| Equal loadings and thresholds | 0.977     | 0.990 | 0.079 | 0.085 | -0.018                  | -0.002 | 0.006   | 0.069  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.171. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4MOSU**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G73E | 0.813   | -2.376      | -1.628      | -0.398      |
| TT4G73F | 0.814   | -1.911      | -1.087      | 0.032       |
| TT4G73G | 0.851   | -2.429      | -1.658      | -0.453      |

Source: OECD, TALIS 2024 database.

### Workplace well-being and stress (T4WELS)

The scale *Workplace well-being and stress* (T4WELS) was measured using a set of four items (TT4G76A, TT4G76B, TT4G76C and TT4G76D). These items assessed the extent to which different situations related to well-being and stress occur. For each item, teachers selected one of the following response options: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher scores reflect lower perceived well-being (and greater perceived stress). Item TT4G76B was reverse coded, as it was the only positive statement about well-being, to ensure it had the same direction as the rest of the items. Table 11.172 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.173, except for Viet Nam (ISCED level 2) due to a translation error with item TT4G76B. As a result, no scale results or scores are provided for Viet Nam. The scale T4WELS has high reliability (above 0.700) across populations. As can be observed from Table 11.173, the CFI, TLI and SRMR for T4WELS are all within the acceptable cut-off across all populations. The RMSEA is greater than 0.100 in ten populations, mainly from ISCED level 2. Specifically, these include Australia, Austria, Cyprus, Estonia, Israel, Malta, Singapore and Sweden, the ISCED level 1 population in the Flemish Community of Belgium and the ISCED level 3 population in Denmark.

Table 11.174 presents the results from the measurement invariance testing for T4WELS for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices but for the CFI for which it is close. The degree of change between the equal loadings and the equal loadings and thresholds models is close to the acceptable range for the TLI and exceeds the cut-offs for the CFI, RMSEA and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.175 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4WELS. All items show high loadings, with the exception of item TT4G76B which shows a low loading. Results by country/territory show a low loading for item TT4G76B across most participants (36 at ISCED level 2, 12 at ISCED level 1 and 3 at ISCED level 3).

**Table 11.172. Items and response categories used in the construction of scale T4WELS**

| Scale or item | Question or item wording                                                                                                                                                                                                 |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4WELS        | In your experience as a teacher at this school, to what extent do the following occur?<br><i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i><br>Scale mid-point: 2.5 |
| TT4G76A       | I experience stress in my work.                                                                                                                                                                                          |
| TT4G76B*      | My job leaves me time for my personal life.                                                                                                                                                                              |
| TT4G76C       | My job negatively impacts my mental health.                                                                                                                                                                              |
| TT4G76D       | My job negatively impacts my physical health.                                                                                                                                                                            |

Note: \* Item was reverse coded.

Source: OECD, TALIS 2024 database.

**Table 11.173. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4WELS**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.788            | 1.000         | 1.000 | 0.000        | 0.004 |
| Alberta (Canada)                | 0.878            | 0.997         | 0.991 | 0.072        | 0.015 |
| Australia                       | 0.866            | 0.995         | 0.985 | <b>0.117</b> | 0.018 |
| Austria                         | 0.863            | 0.991         | 0.973 | <b>0.156</b> | 0.025 |
| Azerbaijan                      | 0.761            | 1.000         | 1.000 | 0.000        | 0.002 |
| Bahrain                         | 0.827            | 0.999         | 0.998 | 0.043        | 0.007 |
| Belgium                         | 0.832            | 0.997         | 0.991 | 0.077        | 0.014 |
| Flemish Community (Belgium)     | 0.858            | 0.996         | 0.987 | 0.099        | 0.017 |
| French Community (Belgium)      | 0.806            | 0.998         | 0.994 | 0.065        | 0.013 |
| Brazil                          | 0.808            | 0.998         | 0.994 | 0.084        | 0.015 |
| Bulgaria                        | 0.844            | 0.999         | 0.996 | 0.064        | 0.011 |
| Chile                           | 0.845            | 0.999         | 0.997 | 0.046        | 0.008 |
| Colombia                        | 0.793            | 1.000         | 1.000 | 0.015        | 0.005 |
| Costa Rica                      | 0.869            | 0.999         | 0.998 | 0.047        | 0.009 |
| Croatia                         | 0.845            | 0.998         | 0.995 | 0.066        | 0.012 |
| Cyprus                          | 0.824            | 0.996         | 0.989 | <b>0.113</b> | 0.020 |
| Czechia                         | 0.817            | 0.995         | 0.984 | 0.097        | 0.018 |
| Denmark                         | 0.841            | 0.996         | 0.987 | 0.093        | 0.016 |
| Estonia                         | 0.835            | 0.993         | 0.978 | <b>0.121</b> | 0.022 |
| Finland                         | 0.850            | 0.995         | 0.985 | 0.092        | 0.018 |
| France                          | 0.803            | 0.997         | 0.990 | 0.085        | 0.018 |
| Hungary                         | 0.844            | 0.999         | 0.998 | 0.040        | 0.008 |



| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Iceland                         | 0.788                           | 0.998         | 0.995 | 0.063        | 0.014 |
| Israel                          | 0.820                           | 0.988         | 0.965 | <b>0.168</b> | 0.034 |
| Italy                           | 0.808                           | 0.997         | 0.991 | 0.078        | 0.016 |
| Japan                           | 0.864                           | 0.999         | 0.997 | 0.070        | 0.010 |
| Kazakhstan                      | 0.764                           | 1.000         | 1.000 | 0.016        | 0.005 |
| Korea                           | 0.799                           | 0.999         | 0.996 | 0.082        | 0.014 |
| Kosovo                          | 0.796                           | 1.000         | 0.999 | 0.019        | 0.006 |
| Latvia                          | 0.824                           | 0.997         | 0.990 | 0.073        | 0.014 |
| Lithuania                       | 0.844                           | 0.997         | 0.991 | 0.084        | 0.015 |
| Malta                           | 0.813                           | 0.991         | 0.974 | <b>0.136</b> | 0.024 |
| Montenegro                      | 0.807                           | 0.999         | 0.997 | 0.053        | 0.010 |
| Morocco                         | 0.807                           | 0.999         | 0.998 | 0.023        | 0.007 |
| Netherlands                     | 0.819                           | 0.997         | 0.991 | 0.058        | 0.015 |
| New Zealand                     | 0.857                           | 0.998         | 0.995 | 0.058        | 0.012 |
| North Macedonia                 | 0.780                           | 1.000         | 1.000 | 0.012        | 0.004 |
| Norway                          | 0.845                           | 0.998         | 0.994 | 0.054        | 0.010 |
| Poland                          | 0.844                           | 0.997         | 0.992 | 0.064        | 0.014 |
| Portugal                        | 0.837                           | 0.999         | 0.996 | 0.062        | 0.011 |
| Romania                         | 0.817                           | 0.997         | 0.990 | 0.069        | 0.016 |
| Saudi Arabia                    | 0.793                           | 1.000         | 0.999 | 0.041        | 0.008 |
| Serbia                          | 0.842                           | 0.999         | 0.997 | 0.064        | 0.011 |
| Shanghai (China)                | 0.754                           | 1.000         | 1.000 | 0.029        | 0.004 |
| Singapore                       | 0.817                           | 0.995         | 0.984 | <b>0.113</b> | 0.017 |
| Slovak Republic                 | 0.793                           | 0.999         | 0.996 | 0.050        | 0.009 |
| Slovenia                        | 0.865                           | 0.997         | 0.991 | 0.092        | 0.015 |
| South Africa                    | 0.734                           | 1.000         | 1.000 | 0.000        | 0.004 |
| Spain                           | 0.845                           | 0.997         | 0.990 | 0.071        | 0.016 |
| Sweden                          | 0.858                           | 0.991         | 0.972 | <b>0.127</b> | 0.022 |
| Türkiye                         | 0.790                           | 0.998         | 0.995 | 0.054        | 0.011 |
| United Arab Emirates            | 0.818                           | 0.998         | 0.995 | 0.058        | 0.012 |
| United States                   | 0.868                           | 0.995         | 0.986 | 0.087        | 0.017 |
| Uzbekistan                      | 0.676                           | 0.999         | 0.998 | 0.031        | 0.008 |
| Viet Nam                        | -                               | -             | -     | -            | -     |
| International pooled data       | 0.819                           | 0.998         | 0.995 | 0.056        | 0.011 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.865                           | 0.997         | 0.991 | 0.096        | 0.014 |
| Belgium                         | 0.813                           | 0.997         | 0.991 | 0.071        | 0.014 |
| Flemish Community (Belgium)     | 0.839                           | 0.989         | 0.968 | <b>0.137</b> | 0.026 |
| French Community (Belgium)      | 0.798                           | 0.999         | 0.997 | 0.041        | 0.009 |
| Brazil                          | 0.742                           | 0.999         | 0.996 | 0.062        | 0.014 |
| France                          | 0.823                           | 0.997         | 0.990 | 0.072        | 0.015 |
| Japan                           | 0.844                           | 0.999         | 0.996 | 0.081        | 0.014 |
| Korea                           | 0.792                           | 1.000         | 0.999 | 0.054        | 0.010 |
| Morocco                         | 0.810                           | 0.999         | 0.997 | 0.027        | 0.007 |
| Netherlands                     | 0.847                           | 0.995         | 0.984 | <b>0.106</b> | 0.023 |
| New Zealand                     | 0.862                           | 0.995         | 0.986 | 0.099        | 0.017 |
| Saudi Arabia                    | 0.795                           | 0.998         | 0.994 | 0.087        | 0.018 |
| Slovenia                        | 0.859                           | 0.998         | 0.993 | 0.082        | 0.013 |
| Spain                           | 0.837                           | 0.999         | 0.997 | 0.036        | 0.008 |
| Türkiye                         | 0.792                           | 1.000         | 0.999 | 0.026        | 0.006 |
| United Arab Emirates            | 0.833                           | 0.999         | 0.998 | 0.041        | 0.009 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| International pooled data       | 0.821                           | 0.998         | 0.994 | 0.057        | 0.012 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.858                           | 0.999         | 0.996 | 0.065        | 0.011 |
| Denmark                         | 0.870                           | 0.994         | 0.982 | <b>0.102</b> | 0.017 |
| Flemish Community (Belgium)     | 0.854                           | 0.997         | 0.992 | 0.074        | 0.012 |
| Portugal                        | 0.856                           | 0.999         | 0.997 | 0.057        | 0.009 |
| Saudi Arabia                    | 0.794                           | 0.999         | 0.998 | 0.046        | 0.009 |
| Slovenia                        | 0.877                           | 0.997         | 0.992 | 0.092        | 0.014 |
| Türkiye                         | 0.787                           | 0.998         | 0.994 | 0.055        | 0.012 |
| United Arab Emirates            | 0.809                           | 1.000         | 0.999 | 0.018        | 0.005 |
| International pooled data       | 0.831                           | 0.996         | 0.989 | 0.087        | 0.016 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand, Norway and Viet Nam are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model. Viet Nam was excluded from this scale due to a translation issue that resulted in one item being treated as not administered.

Source: OECD, TALIS 2024 database.

**Table 11.174. Measurement invariance results from MGCFA for scale T4WELS with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.998     | 0.993 | 0.076 | 0.013 | -                       | -      | -       | -      |
| Equal loadings                | 0.992     | 0.990 | 0.091 | 0.039 | -0.006                  | -0.003 | 0.015   | 0.026  |
| Equal loadings and thresholds | 0.957     | 0.978 | 0.133 | 0.135 | -0.035                  | -0.012 | 0.042   | 0.097  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand, Norway and Viet Nam are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.175. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4WELS**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G76A | 0.781   | -0.973      | 0.165       | 0.957       |
| TT4G76B | 0.352   | -1.195      | -0.048      | 1.359       |
| TT4G76C | 0.960   | -0.376      | 0.647       | 1.329       |
| TT4G76D | 0.859   | -0.251      | 0.744       | 1.402       |

Source: OECD, TALIS 2024 database.

### Workload stress (T4WLOADT)

The scale of *Workload stress* (T4WLOADT) was measured by a set of four items (TT4G77A, TT4G77B, TT4G77C and TT4G77D), for which teachers had to indicate to what extent they experienced different sources of stress in their work. For each item, teachers selected one of the following response options: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher scores indicate greater perceived stress related to workload. Table 11.176 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.177. The scale T4WLOADT has high reliability (above 0.700) across populations. In terms of model fit, the CFI and SRMR are within the cut-off criteria across all populations. The TLI exceeds the cut-off criterion only in the ISCED level 1 population in Belgium and the Flemish Community of Belgium, and in the ISCED level 3 population in Denmark, while the RMSEA exceeds the cut-off criterion in 19 ISCED level 2 participants – particularly in Azerbaijan and North Macedonia – as well as in 7 ISCED level 1 participants and 4 ISCED level 3 participants.

Table 11.178 presents the results from the measurement invariance testing for T4WLOADT for the ISCED level 2 population. The baseline model shows an acceptable model fit with the exception of the RMSEA which is very close to the cut-off. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices except for the CFI, for which it is close. The degree of change between the equal loadings and the equal loadings and thresholds models is close to the acceptable range for the TLI and exceeds the cut-offs for the CFI, RMSEA and SRMR. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

Table 11.179 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4WLOADT. All items show high loadings, except for TT4G77D for which the loadings are still within the acceptable range. Results by country/territory show a low loading for item TT4G77D in Finland and Portugal (ISCED level 2) as well as in Denmark (ISCED level 3).

**Table 11.176. Items and response categories used in the construction of scale T4WLOADT**

| Scale or item | Question or item wording                                                                                 |
|---------------|----------------------------------------------------------------------------------------------------------|
| T4WLOADT      | Thinking about your job at this school, to what extent are the following sources of stress in your work? |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i>   |
|               | Scale mid-point: 2.5                                                                                     |
| TT4G77A       | Having too much lesson preparation                                                                       |
| TT4G77B       | Having too many lessons to teach                                                                         |
| TT4G77C       | Having too much marking                                                                                  |
| TT4G77D       | Having too much administrative work to do (e.g. filling out forms)                                       |

Source: OECD, TALIS 2024 database.

**Table 11.177. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4WLOADT**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.843            | 0.998         | 0.993 | 0.049        | 0.011 |
| Alberta (Canada)                | 0.794            | 0.999         | 0.997 | 0.026        | 0.012 |
| Australia                       | 0.808            | 0.995         | 0.986 | 0.066        | 0.013 |
| Austria                         | 0.755            | 0.984         | 0.953 | 0.090        | 0.021 |
| Azerbaijan                      | 0.879            | 0.974         | 0.923 | <b>0.223</b> | 0.041 |
| Bahrain                         | 0.900            | 0.998         | 0.994 | 0.084        | 0.009 |
| Belgium                         | 0.792            | 0.977         | 0.932 | <b>0.131</b> | 0.027 |
| Flemish Community (Belgium)     | 0.793            | 0.980         | 0.940 | <b>0.122</b> | 0.026 |
| French Community (Belgium)      | 0.788            | 0.981         | 0.944 | <b>0.128</b> | 0.029 |
| Brazil                          | 0.887            | 0.999         | 0.998 | 0.040        | 0.007 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Bulgaria                        | 0.884                           | 0.999         | 0.997 | <b>0.106</b> | 0.019 |
| Chile                           | 0.884                           | 0.988         | 0.963 | <b>0.117</b> | 0.020 |
| Colombia                        | 0.881                           | 0.997         | 0.992 | 0.066        | 0.013 |
| Costa Rica                      | 0.844                           | 0.992         | 0.977 | 0.088        | 0.023 |
| Croatia                         | 0.838                           | 0.998         | 0.993 | 0.048        | 0.010 |
| Cyprus                          | 0.827                           | 0.999         | 0.998 | 0.030        | 0.008 |
| Czechia                         | 0.778                           | 0.990         | 0.971 | 0.084        | 0.020 |
| Denmark                         | 0.747                           | 0.996         | 0.987 | 0.051        | 0.014 |
| Estonia                         | 0.851                           | 0.996         | 0.988 | 0.083        | 0.014 |
| Finland                         | 0.723                           | 0.983         | 0.950 | 0.080        | 0.022 |
| France                          | 0.804                           | 0.992         | 0.975 | 0.092        | 0.019 |
| Hungary                         | 0.865                           | 0.999         | 0.997 | 0.041        | 0.008 |
| Iceland                         | 0.818                           | 0.996         | 0.988 | 0.063        | 0.013 |
| Israel                          | 0.815                           | 1.000         | 1.001 | 0.000        | 0.004 |
| Italy                           | 0.838                           | 0.993         | 0.978 | <b>0.179</b> | 0.033 |
| Japan                           | 0.853                           | 0.990         | 0.970 | <b>0.127</b> | 0.022 |
| Kazakhstan                      | 0.878                           | 0.999         | 0.998 | 0.030        | 0.006 |
| Korea                           | 0.862                           | 0.999         | 0.996 | 0.052        | 0.010 |
| Kosovo                          | 0.807                           | 0.974         | 0.923 | <b>0.137</b> | 0.034 |
| Latvia                          | 0.813                           | 0.993         | 0.980 | 0.075        | 0.018 |
| Lithuania                       | 0.820                           | 0.993         | 0.979 | 0.076        | 0.016 |
| Malta                           | 0.839                           | 0.985         | 0.956 | <b>0.147</b> | 0.023 |
| Montenegro                      | 0.877                           | 0.996         | 0.987 | 0.093        | 0.017 |
| Morocco                         | 0.856                           | 0.997         | 0.992 | 0.051        | 0.014 |
| Netherlands                     | 0.750                           | 0.985         | 0.954 | 0.079        | 0.023 |
| New Zealand                     | 0.836                           | 0.993         | 0.978 | 0.087        | 0.018 |
| North Macedonia                 | 0.893                           | 0.981         | 0.942 | <b>0.236</b> | 0.040 |
| Norway                          | 0.800                           | 0.982         | 0.946 | <b>0.122</b> | 0.026 |
| Poland                          | 0.809                           | 0.994         | 0.983 | 0.054        | 0.015 |
| Portugal                        | 0.828                           | 0.995         | 0.984 | <b>0.131</b> | 0.025 |
| Romania                         | 0.878                           | 0.996         | 0.987 | <b>0.135</b> | 0.024 |
| Saudi Arabia                    | 0.924                           | 0.998         | 0.995 | 0.093        | 0.011 |
| Serbia                          | 0.871                           | 0.991         | 0.973 | <b>0.132</b> | 0.025 |
| Shanghai (China)                | 0.866                           | 0.999         | 0.998 | 0.048        | 0.007 |
| Singapore                       | 0.812                           | 0.997         | 0.991 | 0.058        | 0.012 |
| Slovak Republic                 | 0.819                           | 1.000         | 1.001 | 0.000        | 0.002 |
| Slovenia                        | 0.800                           | 1.000         | 1.001 | 0.000        | 0.004 |
| South Africa                    | 0.881                           | 0.991         | 0.973 | <b>0.114</b> | 0.021 |
| Spain                           | 0.827                           | 0.990         | 0.969 | 0.095        | 0.023 |
| Sweden                          | 0.759                           | 0.991         | 0.974 | 0.070        | 0.020 |
| Türkiye                         | 0.830                           | 0.987         | 0.961 | <b>0.109</b> | 0.022 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| United Arab Emirates            | 0.894                           | 0.999         | 0.998        | 0.032        | 0.007 |
| United States                   | 0.839                           | 1.000         | 0.999        | 0.015        | 0.007 |
| Uzbekistan                      | 0.850                           | 0.990         | 0.969        | <b>0.120</b> | 0.020 |
| Viet Nam                        | 0.925                           | 0.997         | 0.991        | <b>0.136</b> | 0.013 |
| International pooled data       | 0.838                           | 0.994         | 0.983        | 0.079        | 0.015 |
| <b>ISCED level 1</b>            |                                 |               |              |              |       |
| Australia                       | 0.842                           | 0.995         | 0.985        | 0.079        | 0.014 |
| Belgium                         | 0.778                           | 0.962         | <b>0.885</b> | <b>0.157</b> | 0.035 |
| Flemish Community (Belgium)     | 0.752                           | 0.959         | <b>0.876</b> | <b>0.150</b> | 0.035 |
| French Community (Belgium)      | 0.807                           | 0.982         | 0.946        | <b>0.126</b> | 0.029 |
| Brazil                          | 0.890                           | 0.994         | 0.983        | <b>0.127</b> | 0.020 |
| France                          | 0.802                           | 0.998         | 0.994        | 0.043        | 0.012 |
| Japan                           | 0.890                           | 0.994         | 0.982        | <b>0.127</b> | 0.018 |
| Korea                           | 0.856                           | 0.999         | 0.998        | 0.034        | 0.007 |
| Morocco                         | 0.872                           | 0.999         | 0.998        | 0.034        | 0.010 |
| Netherlands                     | 0.758                           | 0.967         | 0.901        | <b>0.126</b> | 0.048 |
| New Zealand                     | 0.842                           | 0.996         | 0.989        | 0.061        | 0.014 |
| Saudi Arabia                    | 0.931                           | 0.998         | 0.993        | <b>0.124</b> | 0.012 |
| Slovenia                        | 0.799                           | 1.000         | 1.000        | 0.009        | 0.005 |
| Spain                           | 0.827                           | 0.991         | 0.972        | 0.083        | 0.022 |
| Türkiye                         | 0.823                           | 0.987         | 0.960        | 0.099        | 0.024 |
| United Arab Emirates            | 0.895                           | 0.994         | 0.983        | <b>0.109</b> | 0.018 |
| International pooled data       | 0.824                           | 0.996         | 0.987        | 0.075        | 0.015 |
| <b>ISCED level 3</b>            |                                 |               |              |              |       |
| Croatia                         | 0.852                           | 0.995         | 0.986        | 0.079        | 0.014 |
| Denmark                         | 0.676                           | 0.957         | <b>0.871</b> | <b>0.113</b> | 0.031 |
| Flemish Community (Belgium)     | 0.772                           | 0.983         | 0.948        | <b>0.104</b> | 0.024 |
| Portugal                        | 0.843                           | 0.994         | 0.982        | <b>0.140</b> | 0.026 |
| Saudi Arabia                    | 0.933                           | 0.998         | 0.994        | <b>0.130</b> | 0.014 |
| Slovenia                        | 0.785                           | 0.999         | 0.996        | 0.030        | 0.008 |
| Türkiye                         | 0.826                           | 0.997         | 0.990        | 0.057        | 0.011 |
| United Arab Emirates            | 0.906                           | 0.997         | 0.990        | 0.076        | 0.013 |
| International pooled data       | 0.840                           | 0.994         | 0.981        | 0.085        | 0.016 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.178. Measurement invariance results from MGCFA for scale T4WLOADT with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.994     | 0.983 | 0.104 | 0.017 | -                       | -      | -       | -      |
| Equal loadings                | 0.985     | 0.981 | 0.109 | 0.036 | -0.010                  | -0.002 | 0.005   | 0.020  |
| Equal loadings and thresholds | 0.928     | 0.964 | 0.151 | 0.144 | -0.056                  | -0.018 | 0.043   | 0.108  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.179. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4WLOADT**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G77A | 0.802   | -0.749      | 0.348       | 1.219       |
| TT4G77B | 0.824   | -0.433      | 0.462       | 1.201       |
| TT4G77C | 0.834   | -0.672      | 0.238       | 0.989       |
| TT4G77D | 0.590   | -0.876      | 0.048       | 0.805       |

Source: OECD, TALIS 2024 database.

### Student behaviour stress (T4STBEH)

The scale *Student behaviour stress* (T4STBEH) was measured using a set of three items (TT4G77F, TT4G77G and TT4G77H). These items assessed the extent to which various factors were sources of stress in teachers' work. For each item, teachers selected one of the following response options: "Not at all", "To some extent", "Quite a bit" and "A lot". Higher scores indicate greater perceived stress related to student behaviour. Table 11.180 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.181. The fit indices for the T4STBEH scale are not presented here as the scale was measured by just three items. The reliabilities for T4STBEH are generally high in all populations, except for the ISCED level 2 population in Serbia.

Table 11.182 presents the results from the measurement invariance testing for T4STBEH for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The equal loadings model is within the cut-off criteria for all fit indices but for the RMSEA. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the RMSEA and exceeds the cut-offs for the CFI, TLI and SRMR. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.183 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4STBEH. All items show high loadings. Results by participating country/territory show a low loading for item TT4G77F in the ISCED level 2 population in Belgium, Czechia, the Flemish Community of Belgium, Latvia, Lithuania and Slovenia; the ISCED level 1 population in Belgium, the Flemish Community of Belgium, the French Community of Belgium, the Netherlands and Slovenia; and the ISCED level 2 population in Croatia, the Flemish Community of Belgium, Portugal and Slovenia. Item

TT4G77H also shows low loadings in Bahrain, Israel and Serbia (ISCED level 2), and in Morocco and Saudi Arabia (ISCED level 1).

**Table 11.180. Items and response categories used in the construction of scale T4STBEH**

| Scale or item | Question or item wording                                                                                 |
|---------------|----------------------------------------------------------------------------------------------------------|
| T4STBEH       | Thinking about your job at this school, to what extent are the following sources of stress in your work? |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i>   |
|               | Scale mid-point: 2.5                                                                                     |
| TT4G77F       | Being held responsible for students' achievement                                                         |
| TT4G77G       | Maintaining classroom discipline                                                                         |
| TT4G77H       | Being intimidated or verbally abused by students                                                         |

Source: OECD, TALIS 2024 database.

**Table 11.181. Reliability coefficient alpha for single countries and pooled model for scale T4STBEH**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.794                           |
| Alberta (Canada)                | 0.742                           |
| Australia                       | 0.753                           |
| Austria                         | 0.732                           |
| Azerbaijan                      | 0.781                           |
| Bahrain                         | 0.720                           |
| Belgium                         | 0.693                           |
| Flemish Community (Belgium)     | 0.673                           |
| French Community (Belgium)      | 0.719                           |
| Brazil                          | 0.788                           |
| Bulgaria                        | 0.763                           |
| Chile                           | 0.747                           |
| Colombia                        | 0.779                           |
| Costa Rica                      | 0.779                           |
| Croatia                         | 0.738                           |
| Cyprus                          | 0.730                           |
| Czechia                         | 0.662                           |
| Denmark                         | 0.707                           |
| Estonia                         | 0.658                           |
| Finland                         | 0.739                           |
| France                          | 0.715                           |
| Hungary                         | 0.745                           |
| Iceland                         | 0.717                           |
| Israel                          | 0.685                           |
| Italy                           | 0.729                           |
| Japan                           | 0.743                           |
| Kazakhstan                      | 0.789                           |
| Korea                           | 0.784                           |
| Kosovo                          | 0.789                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Latvia                          | 0.643                           |
| Lithuania                       | 0.681                           |
| Malta                           | 0.770                           |
| Montenegro                      | 0.768                           |
| Morocco                         | 0.719                           |
| Netherlands                     | 0.710                           |
| New Zealand                     | 0.754                           |
| North Macedonia                 | 0.784                           |
| Norway                          | 0.742                           |
| Poland                          | 0.690                           |
| Portugal                        | 0.722                           |
| Romania                         | 0.764                           |
| Saudi Arabia                    | 0.757                           |
| Serbia                          | <b>0.524</b>                    |
| Shanghai (China)                | 0.751                           |
| Singapore                       | 0.736                           |
| Slovak Republic                 | 0.726                           |
| Slovenia                        | 0.648                           |
| South Africa                    | 0.758                           |
| Spain                           | 0.725                           |
| Sweden                          | 0.751                           |
| Türkiye                         | 0.742                           |
| United Arab Emirates            | 0.767                           |
| United States                   | 0.781                           |
| Uzbekistan                      | 0.720                           |
| Viet Nam                        | 0.774                           |
| International pooled data       | 0.737                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.765                           |
| Belgium                         | 0.660                           |
| Flemish Community (Belgium)     | 0.677                           |
| French Community (Belgium)      | 0.655                           |
| Brazil                          | 0.780                           |
| France                          | 0.688                           |
| Japan                           | 0.773                           |
| Korea                           | 0.767                           |
| Morocco                         | 0.616                           |
| Netherlands                     | 0.719                           |
| New Zealand                     | 0.732                           |
| Saudi Arabia                    | 0.768                           |
| Slovenia                        | 0.668                           |
| Spain                           | 0.683                           |
| Türkiye                         | 0.737                           |
| United Arab Emirates            | 0.800                           |
| International pooled data       | 0.713                           |
| <b>ISCED level 3</b>            |                                 |



| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Croatia                         | 0.685                           |
| Denmark                         | 0.731                           |
| Flemish Community (Belgium)     | 0.691                           |
| Portugal                        | 0.696                           |
| Saudi Arabia                    | 0.781                           |
| Slovenia                        | 0.678                           |
| Türkiye                         | 0.745                           |
| United Arab Emirates            | 0.811                           |
| International pooled data       | 0.753                           |

Note: Coefficients in **bold** exceed the cut-off criterion. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.182. Measurement invariance results from MGCFA for scale T4STBEH with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.971     | 0.955 | 0.112 | 0.036 | -0.029                  | -0.045 | 0.112   | 0.036  |
| Equal loadings and thresholds | 0.835     | 0.928 | 0.142 | 0.119 | -0.136                  | -0.027 | 0.030   | 0.083  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.183. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4STBEH**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G77F | 0.610   | -0.926      | 0.042       | 0.914       |
| TT4G77G | 0.892   | -0.829      | 0.103       | 0.891       |
| TT4G77H | 0.608   | 0.205       | 0.951       | 1.515       |

Source: OECD, TALIS 2024 database.

### **Job satisfaction with work environment (T4JSENV)**

The scale *Job satisfaction with work environment* (T4JSENV) was measured using a set of three items (TT4G78C, TT4G78E and TT4G78G). These items assessed the level of agreement with different statements related to how teachers feel about their job. For each item, teachers selected one of the following response options: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher scores reflect greater satisfaction with the work environment. Item TT4G78C was reverse coded due to its negative statement about satisfaction with the work environment and to ensure it had the same direction as the rest of the items. Table 11.184 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.185. The fit indices for the T4JSENV scale are not presented here as the scale was measured by just three items. The scale reliabilities for T4JSENV are high (above 0.700) in all populations.

Table 11.186 presents the results from the measurement invariance testing for T4JSENV for the ISCED level 2 population. As a three-item scale, the baseline model has a perfect fit because it is just identified. The equal loadings model is within the cut-off criteria for all fit indices but for the RMSEA. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the RMSEA and close to the cut-offs for the CFI, TLI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.187 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4JSENV. All items show high loadings. Results by participating country/territory show a low loading for item TT4G78C in Azerbaijan, Uzbekistan and Viet Nam (ISCED level 2) and in Morocco (ISCED level 1).

**Table 11.184. Items and response categories used in the construction of scale T4JSENV**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4JSENV       | We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?<br><i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i><br>Scale mid-point: 2.5 |
| TT4G78C*      | I would like to change to another school if that were possible.                                                                                                                                                                                                         |
| TT4G78E       | I enjoy working at this school.                                                                                                                                                                                                                                         |
| TT4G78G       | I would recommend this school as a good place to work.                                                                                                                                                                                                                  |

Note: \* Item was reverse coded.

Source: OECD, TALIS 2024 database.

**Table 11.185. Reliability coefficient alpha for single countries and pooled model for scale T4JSENV**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.749                           |
| Alberta (Canada)                | 0.897                           |
| Australia                       | 0.886                           |
| Austria                         | 0.881                           |
| Azerbaijan                      | 0.718                           |
| Bahrain                         | 0.825                           |
| Belgium                         | 0.900                           |
| Flemish Community (Belgium)     | 0.896                           |
| French Community (Belgium)      | 0.907                           |
| Brazil                          | 0.866                           |
| Bulgaria                        | 0.855                           |
| Chile                           | 0.845                           |
| Colombia                        | 0.809                           |
| Costa Rica                      | 0.797                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Croatia                         | 0.872                           |
| Cyprus                          | 0.854                           |
| Czechia                         | 0.867                           |
| Denmark                         | 0.887                           |
| Estonia                         | 0.869                           |
| Finland                         | 0.839                           |
| France                          | 0.849                           |
| Hungary                         | 0.867                           |
| Iceland                         | 0.877                           |
| Israel                          | 0.885                           |
| Italy                           | 0.878                           |
| Japan                           | 0.794                           |
| Kazakhstan                      | 0.777                           |
| Korea                           | 0.842                           |
| Kosovo                          | 0.772                           |
| Latvia                          | 0.806                           |
| Lithuania                       | 0.843                           |
| Malta                           | 0.857                           |
| Montenegro                      | 0.818                           |
| Morocco                         | 0.741                           |
| Netherlands                     | 0.853                           |
| New Zealand                     | 0.896                           |
| North Macedonia                 | 0.769                           |
| Norway                          | 0.863                           |
| Poland                          | 0.816                           |
| Portugal                        | 0.857                           |
| Romania                         | 0.860                           |
| Saudi Arabia                    | 0.806                           |
| Serbia                          | 0.779                           |
| Shanghai (China)                | 0.800                           |
| Singapore                       | 0.862                           |
| Slovak Republic                 | 0.834                           |
| Slovenia                        | 0.834                           |
| South Africa                    | 0.845                           |
| Spain                           | 0.863                           |
| Sweden                          | 0.863                           |
| Türkiye                         | 0.881                           |
| United Arab Emirates            | 0.848                           |
| United States                   | 0.894                           |
| Uzbekistan                      | 0.708                           |
| Viet Nam                        | 0.746                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| International pooled data       | 0.841                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.896                           |
| Belgium                         | 0.899                           |
| Flemish Community (Belgium)     | 0.910                           |
| French Community (Belgium)      | 0.887                           |
| Brazil                          | 0.849                           |
| France                          | 0.889                           |
| Japan                           | 0.800                           |
| Korea                           | 0.847                           |
| Morocco                         | 0.732                           |
| Netherlands                     | 0.912                           |
| New Zealand                     | 0.884                           |
| Saudi Arabia                    | 0.781                           |
| Slovenia                        | 0.836                           |
| Spain                           | 0.882                           |
| Türkiye                         | 0.882                           |
| United Arab Emirates            | 0.836                           |
| International pooled data       | 0.864                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.888                           |
| Denmark                         | 0.880                           |
| Flemish Community (Belgium)     | 0.903                           |
| Portugal                        | 0.872                           |
| Saudi Arabia                    | 0.802                           |
| Slovenia                        | 0.848                           |
| Türkiye                         | 0.878                           |
| United Arab Emirates            | 0.830                           |
| International pooled data       | 0.854                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.186. Measurement invariance results from MGCFA for scale T4JSENV with differences in model fits across models for ISCED level 2**

| Invariance model     | Model fit |       |       |       | Difference in model fit |        |         |        |
|----------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                      | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b> |           |       |       |       |                         |        |         |        |
| Baseline             | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings       | 0.991     | 0.987 | 0.110 | 0.020 | -0.009                  | -0.013 | 0.110   | 0.020  |

| Invariance model              | Model fit |       |       |       | Difference in model fit |              |                |               |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------------|----------------|---------------|
|                               | CFI       | TLI   | RMSEA | SRMR  | $\Delta$ CFI            | $\Delta$ TLI | $\Delta$ RMSEA | $\Delta$ SRMR |
| Equal loadings and thresholds | 0.980     | 0.991 | 0.088 | 0.081 | -0.011                  | 0.005        | -0.022         | 0.061         |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.187. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4JSENV**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G78C | 0.642   | -1.562      | -0.791      | 0.395       |
| TT4G78E | 0.881   | -2.007      | -1.240      | 0.327       |
| TT4G78G | 0.869   | -1.802      | -1.004      | 0.455       |

Source: OECD, TALIS 2024 database.

### Job satisfaction with profession (T4JSPROT)

The scale *Job satisfaction with profession* (T4JSPROT) was measured using a set of four items (TT4G78A, TT4G78B, TT4G78D and TT4G78J). These items assessed teachers' level of agreement with different statements related to the teaching profession. For each item, teachers selected one of the following response options: "Strongly disagree", "Disagree", "Agree" and "Strongly agree". Higher scores reflect greater satisfaction with the profession. Item TT4G78D was reverse coded due to its negative statement about satisfaction with the profession and to ensure it had the same direction as the rest of the items.

Table 11.188 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.189. The scale T4JSPROT has high reliability (above 0.700) in all populations. As can be observed from Table 11.189, the CFI, TLI and SRMR for T4JSPROT are all within the acceptable cut-off criteria for all participants. However, the RMSEA exceeds the cut-off criterion in 20 of the ISCED level 2 participants, 3 of the ISCED level 1 participants, and 6 of the ISCED level 3 participants. Across all populations, the largest RMSEA values were observed in the ISCED level 2 population in Denmark, Iceland and New Zealand, with values above 0.160.

Table 11.190 presents the results from the measurement invariance testing for T4JSPROT for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA and SRMR and close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA and exceeds the cut-offs for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.191 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4JSPROT. All items show high loadings, except for TT4G78A for which the loading falls within the acceptable range. Results by participating country/territory show a low loading for item TT4G78D in Azerbaijan.

**Table 11.188. Items and response categories used in the construction of scale T4JSPROT**

| Scale or item | Question or item wording                                                                                                          |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------|
| T4JSPROT      | We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements? |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i>                        |
|               | Scale mid-point: 2.5                                                                                                              |
| TT4G78A       | The advantages of being a teacher clearly outweigh the disadvantages.                                                             |
| TT4G78B       | If I could decide again, I would still choose to work as a teacher.                                                               |
| TT4G78D*      | I regret that I decided to become a teacher.                                                                                      |
| TT4G78J       | All in all, I am satisfied with my job.                                                                                           |

Note: \* Item was reverse coded.

Source: OECD, TALIS 2024 database.

**Table 11.189. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4JSPROT**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.795            | 0.992         | 0.977 | 0.080        | 0.019 |
| Alberta (Canada)                | 0.907            | 0.990         | 0.969 | <b>0.149</b> | 0.026 |
| Australia                       | 0.896            | 0.994         | 0.981 | <b>0.128</b> | 0.015 |
| Austria                         | 0.868            | 0.996         | 0.989 | 0.075        | 0.013 |
| Azerbaijan                      | 0.729            | 0.996         | 0.989 | 0.045        | 0.011 |
| Bahrain                         | 0.849            | 0.990         | 0.970 | <b>0.120</b> | 0.016 |
| Belgium                         | 0.850            | 0.992         | 0.977 | <b>0.110</b> | 0.021 |
| Flemish Community (Belgium)     | 0.851            | 0.988         | 0.963 | <b>0.146</b> | 0.027 |
| French Community (Belgium)      | 0.845            | 1.000         | 0.999 | 0.018        | 0.005 |
| Brazil                          | 0.818            | 0.992         | 0.976 | 0.085        | 0.015 |
| Bulgaria                        | 0.862            | 0.999         | 0.996 | 0.042        | 0.008 |
| Chile                           | 0.798            | 0.994         | 0.981 | 0.054        | 0.017 |
| Colombia                        | 0.837            | 0.987         | 0.961 | <b>0.107</b> | 0.020 |
| Costa Rica                      | 0.770            | 0.988         | 0.963 | 0.086        | 0.021 |
| Croatia                         | 0.877            | 0.994         | 0.983 | 0.099        | 0.014 |
| Cyprus                          | 0.859            | 0.998         | 0.993 | 0.062        | 0.009 |
| Czechia                         | 0.844            | 0.994         | 0.981 | 0.091        | 0.016 |
| Denmark                         | 0.904            | 0.989         | 0.968 | <b>0.165</b> | 0.017 |
| Estonia                         | 0.831            | 0.995         | 0.986 | 0.073        | 0.014 |
| Finland                         | 0.904            | 0.996         | 0.989 | 0.100        | 0.013 |
| France                          | 0.855            | 0.993         | 0.980 | <b>0.109</b> | 0.017 |
| Hungary                         | 0.831            | 0.996         | 0.987 | 0.075        | 0.014 |
| Iceland                         | 0.879            | 0.989         | 0.967 | <b>0.160</b> | 0.017 |
| Israel                          | 0.856            | 0.989         | 0.966 | <b>0.110</b> | 0.017 |
| Italy                           | 0.829            | 0.995         | 0.985 | 0.076        | 0.015 |
| Japan                           | 0.867            | 0.995         | 0.984 | 0.094        | 0.013 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Kazakhstan                      | 0.758                           | 0.996         | 0.987 | 0.046        | 0.012 |
| Korea                           | 0.903                           | 0.993         | 0.980 | <b>0.143</b> | 0.014 |
| Kosovo                          | 0.768                           | 0.995         | 0.984 | 0.060        | 0.017 |
| Latvia                          | 0.782                           | 0.997         | 0.990 | 0.045        | 0.012 |
| Lithuania                       | 0.848                           | 0.997         | 0.991 | 0.064        | 0.012 |
| Malta                           | 0.872                           | 0.992         | 0.975 | <b>0.136</b> | 0.017 |
| Montenegro                      | 0.843                           | 0.994         | 0.981 | 0.098        | 0.013 |
| Morocco                         | 0.857                           | 0.996         | 0.988 | 0.058        | 0.014 |
| Netherlands                     | 0.892                           | 0.992         | 0.975 | 0.098        | 0.015 |
| New Zealand                     | 0.883                           | 0.987         | 0.960 | <b>0.179</b> | 0.025 |
| North Macedonia                 | 0.783                           | 0.989         | 0.966 | 0.097        | 0.022 |
| Norway                          | 0.900                           | 0.991         | 0.972 | <b>0.155</b> | 0.021 |
| Poland                          | 0.875                           | 0.999         | 0.996 | 0.039        | 0.006 |
| Portugal                        | 0.805                           | 0.997         | 0.990 | 0.069        | 0.014 |
| Romania                         | 0.815                           | 0.994         | 0.983 | 0.073        | 0.016 |
| Saudi Arabia                    | 0.850                           | 0.983         | 0.949 | <b>0.157</b> | 0.022 |
| Serbia                          | 0.844                           | 0.997         | 0.991 | 0.069        | 0.011 |
| Shanghai (China)                | 0.834                           | 0.989         | 0.968 | <b>0.139</b> | 0.017 |
| Singapore                       | 0.872                           | 0.994         | 0.981 | <b>0.106</b> | 0.015 |
| Slovak Republic                 | 0.859                           | 0.995         | 0.985 | 0.089        | 0.014 |
| Slovenia                        | 0.891                           | 0.995         | 0.984 | <b>0.113</b> | 0.014 |
| South Africa                    | 0.780                           | 0.992         | 0.977 | 0.066        | 0.014 |
| Spain                           | 0.860                           | 0.997         | 0.990 | 0.053        | 0.012 |
| Sweden                          | 0.874                           | 0.994         | 0.982 | <b>0.103</b> | 0.015 |
| Türkiye                         | 0.866                           | 0.992         | 0.976 | <b>0.118</b> | 0.017 |
| United Arab Emirates            | 0.846                           | 0.997         | 0.992 | 0.041        | 0.009 |
| United States                   | 0.894                           | 0.994         | 0.981 | 0.097        | 0.016 |
| Uzbekistan                      | 0.789                           | 0.995         | 0.985 | 0.066        | 0.013 |
| Viet Nam                        | 0.766                           | 0.983         | 0.949 | <b>0.133</b> | 0.021 |
| International pooled data       | 0.844                           | 0.994         | 0.981 | 0.079        | 0.014 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.904                           | 0.993         | 0.978 | <b>0.146</b> | 0.017 |
| Belgium                         | 0.841                           | 0.995         | 0.986 | 0.089        | 0.020 |
| Flemish Community (Belgium)     | 0.851                           | 0.995         | 0.986 | 0.096        | 0.022 |
| French Community (Belgium)      | 0.807                           | 0.998         | 0.993 | 0.051        | 0.012 |
| Brazil                          | 0.807                           | 0.994         | 0.981 | 0.068        | 0.015 |
| France                          | 0.861                           | 0.994         | 0.983 | 0.092        | 0.016 |
| Japan                           | 0.881                           | 0.997         | 0.992 | 0.071        | 0.009 |
| Korea                           | 0.918                           | 0.996         | 0.988 | <b>0.125</b> | 0.012 |
| Morocco                         | 0.846                           | 0.992         | 0.975 | 0.087        | 0.016 |
| Netherlands                     | 0.872                           | 0.999         | 0.998 | 0.029        | 0.008 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| New Zealand                     | 0.863                           | 0.994         | 0.983 | 0.087        | 0.015 |
| Saudi Arabia                    | 0.838                           | 0.988         | 0.963 | <b>0.116</b> | 0.017 |
| Slovenia                        | 0.891                           | 0.996         | 0.988 | 0.095        | 0.010 |
| Spain                           | 0.853                           | 0.998         | 0.994 | 0.036        | 0.009 |
| Türkiye                         | 0.860                           | 0.994         | 0.981 | 0.093        | 0.014 |
| United Arab Emirates            | 0.827                           | 0.993         | 0.978 | 0.077        | 0.015 |
| International pooled data       | 0.864                           | 0.994         | 0.982 | 0.090        | 0.014 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.893                           | 0.997         | 0.990 | 0.087        | 0.011 |
| Denmark                         | 0.900                           | 0.987         | 0.962 | <b>0.158</b> | 0.022 |
| Flemish Community (Belgium)     | 0.861                           | 0.992         | 0.976 | <b>0.110</b> | 0.019 |
| Portugal                        | 0.830                           | 0.997         | 0.991 | 0.079        | 0.016 |
| Saudi Arabia                    | 0.856                           | 0.985         | 0.956 | <b>0.149</b> | 0.020 |
| Slovenia                        | 0.872                           | 0.994         | 0.981 | <b>0.112</b> | 0.015 |
| Türkiye                         | 0.857                           | 0.993         | 0.980 | <b>0.102</b> | 0.015 |
| United Arab Emirates            | 0.838                           | 0.976         | 0.927 | <b>0.112</b> | 0.024 |
| International pooled data       | 0.860                           | 0.992         | 0.975 | <b>0.105</b> | 0.015 |

Note: Coefficients in **bold** do not meet the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.190. Measurement invariance results from MGCFA for scale T4JSPROT with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.994     | 0.982 | 0.088 | 0.015 | -                       | -      | -       | -      |
| Equal loadings                | 0.982     | 0.978 | 0.097 | 0.031 | -0.012                  | -0.004 | 0.010   | 0.016  |
| Equal loadings and thresholds | 0.961     | 0.980 | 0.093 | 0.101 | -0.021                  | 0.002  | -0.004  | 0.070  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.191. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4JSPROT**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G78A | 0.687   | -1.696      | -0.663      | 0.815       |
| TT4G78B | 0.886   | -1.516      | -0.674      | 0.551       |
| TT4G78D | 0.727   | -1.861      | -1.182      | 0.077       |
| TT4G78J | 0.729   | -2.157      | -1.295      | 0.465       |

Source: OECD, TALIS 2024 database.



### Perceptions of value and policy influence (T4VALP)

Teachers answered three items measuring their *Perceptions of value and policy influence* (T4VALP). These items were TT4G79E, TT4G79F and TT4G79G. For each item, they had to indicate their level of agreement, using the following response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale indicate more positive perceptions of value and policy influence. Table 11.192 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.193. The fit indices for the T4VALP scale are not presented here as the scale was measured by just three items. The scale T4VALP has generally high reliability (above 0.700) across all populations.

Table 11.194 presents the results from the measurement invariance testing for T4VALP for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The equal loadings model is within the cut-off criteria for the CFI, TLI and SRMR and exceeds the cut-off for the RMSEA. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA and exceeds the cut-offs for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.195 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4VALP. All items show high loadings. Results by participating country/territory show a low loading for item TT4G79F in Brazil (ISCED level 1).

**Table 11.192. Items and response categories used in the construction of scale T4VALP**

| Scale or item | Question or item wording                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------|
| T4VALP        | How strongly do you agree or disagree with the following statements?                                       |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i> |
|               | Scale mid-point: 2.5                                                                                       |
| TT4G79E       | Teachers' views are valued by policymakers in this <country/region>.                                       |
| TT4G79F       | Teachers can influence educational policy in this <country/region>.                                        |
| TT4G79G       | Teachers are valued in the media in this <country/region>.                                                 |

Source: OECD, TALIS 2024 database.

**Table 11.193. Reliability coefficient alpha for single countries and pooled model for scale T4VALP**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.719                           |
| Alberta (Canada)                | 0.894                           |
| Australia                       | 0.875                           |
| Austria                         | 0.852                           |
| Azerbaijan                      | 0.864                           |
| Bahrain                         | 0.891                           |
| Belgium                         | 0.817                           |
| Flemish Community (Belgium)     | 0.778                           |
| French Community (Belgium)      | 0.852                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Brazil                          | 0.757                           |
| Bulgaria                        | 0.892                           |
| Chile                           | 0.730                           |
| Colombia                        | 0.760                           |
| Costa Rica                      | 0.857                           |
| Croatia                         | 0.897                           |
| Cyprus                          | 0.874                           |
| Czechia                         | 0.861                           |
| Denmark                         | 0.873                           |
| Estonia                         | 0.790                           |
| Finland                         | 0.855                           |
| France                          | 0.825                           |
| Hungary                         | 0.914                           |
| Iceland                         | 0.823                           |
| Israel                          | 0.802                           |
| Italy                           | 0.814                           |
| Japan                           | 0.934                           |
| Kazakhstan                      | 0.858                           |
| Korea                           | 0.930                           |
| Kosovo                          | 0.775                           |
| Latvia                          | 0.868                           |
| Lithuania                       | 0.847                           |
| Malta                           | 0.855                           |
| Montenegro                      | 0.934                           |
| Morocco                         | 0.796                           |
| Netherlands                     | 0.829                           |
| New Zealand                     | 0.851                           |
| North Macedonia                 | 0.853                           |
| Norway                          | 0.862                           |
| Poland                          | 0.905                           |
| Portugal                        | 0.679                           |
| Romania                         | 0.857                           |
| Saudi Arabia                    | 0.890                           |
| Serbia                          | 0.901                           |
| Shanghai (China)                | 0.924                           |
| Singapore                       | 0.899                           |
| Slovak Republic                 | 0.825                           |
| Slovenia                        | 0.834                           |
| South Africa                    | 0.814                           |
| Spain                           | 0.836                           |
| Sweden                          | 0.894                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Türkiye                         | 0.850                           |
| United Arab Emirates            | 0.910                           |
| United States                   | 0.833                           |
| Uzbekistan                      | 0.901                           |
| Viet Nam                        | 0.888                           |
| International pooled data       | 0.879                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.889                           |
| Belgium                         | 0.808                           |
| Flemish Community (Belgium)     | 0.758                           |
| French Community (Belgium)      | 0.842                           |
| Brazil                          | 0.679                           |
| France                          | 0.816                           |
| Japan                           | 0.929                           |
| Korea                           | 0.929                           |
| Morocco                         | 0.763                           |
| Netherlands                     | 0.807                           |
| New Zealand                     | 0.871                           |
| Saudi Arabia                    | 0.888                           |
| Slovenia                        | 0.838                           |
| Spain                           | 0.827                           |
| Türkiye                         | 0.853                           |
| United Arab Emirates            | 0.918                           |
| International pooled data       | 0.884                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.919                           |
| Denmark                         | 0.867                           |
| Flemish Community (Belgium)     | 0.824                           |
| Portugal                        | 0.683                           |
| Saudi Arabia                    | 0.886                           |
| Slovenia                        | 0.848                           |
| Türkiye                         | 0.849                           |
| United Arab Emirates            | 0.918                           |
| International pooled data       | 0.901                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.194. Measurement invariance results from MGCFA for scale T4VALP with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.989     | 0.983 | 0.141 | 0.023 | -0.011                  | -0.017 | 0.141   | 0.023  |
| Equal loadings and thresholds | 0.962     | 0.983 | 0.138 | 0.138 | -0.027                  | 0.001  | -0.003  | 0.116  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.195. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4VALP**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G79E | 0.906   | -0.552      | 0.540       | 1.628       |
| TT4G79F | 0.757   | -0.684      | 0.350       | 1.425       |
| TT4G79G | 0.866   | -0.608      | 0.472       | 1.652       |

Source: OECD, TALIS 2024 database.

### Joy of teaching (T4JOYTCH)

The scale *Joy of teaching* (T4JOYTCH) was measured using a set of four items (TT4G80A, TT4G80B, TT4G80C and TT4G80D). These items assessed the level of agreement with different statements about their experiences as teachers. For each item, teachers selected one of the following response options: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher scores reflect greater joy of teaching.

Table 11.196 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.197. The scale T4JOYTCH has high reliability (above 0.700) in all populations. As can be seen in Table 11.197, the CFI, TLI and SRMR of T4JOYTCH are within the cut-off criteria for all participants. The RMSEA exceeds the cut-off criterion in 17 ISCED level 2 participants, 3 ISCED level 1 participants (Brazil, Japan and Saudi Arabia) and in the ISCED level 3 population in Saudi Arabia.

Table 11.198 presents the results from the measurement invariance testing for T4JOYTCH for the ISCED level 2 population. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA and SRMR and close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI and TLI, close for the RMSEA and exceeds the cut-off SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.199 presents the standardised item loadings and thresholds based on pooled data from ISCED level 2 for the scale T4JOYTCH. All items show high loadings for the pooled model as well as in single countries/territories.

Table 11.196. Items and response categories used in the construction of scale T4JOYTCH

| Scale or item | Question or item wording                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------|
| T4JOYTCH      | How strongly do you agree or disagree with these statements about your experiences as a teacher?           |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i> |
|               | Scale mid-point: 2.5                                                                                       |
| TT4G80A       | I like the subject(s) that I teach.                                                                        |
| TT4G80B       | I often feel happy while I teach.                                                                          |
| TT4G80C       | I generally teach with enthusiasm.                                                                         |
| TT4G80D       | The interesting challenges of teaching give me satisfaction.                                               |

Source: OECD, TALIS 2024 database.

Table 11.197. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4JOYTCH

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.932            | 1.000         | 0.999 | 0.031        | 0.006 |
| Alberta (Canada)                | 0.892            | 1.000         | 0.999 | 0.023        | 0.008 |
| Australia                       | 0.893            | 1.000         | 0.999 | 0.027        | 0.007 |
| Austria                         | 0.864            | 1.000         | 0.999 | 0.018        | 0.007 |
| Azerbaijan                      | 0.944            | 0.999         | 0.997 | 0.073        | 0.006 |
| Bahrain                         | 0.952            | 0.998         | 0.995 | <b>0.109</b> | 0.006 |
| Belgium                         | 0.891            | 0.998         | 0.993 | 0.078        | 0.018 |
| Flemish Community (Belgium)     | 0.895            | 0.999         | 0.996 | 0.058        | 0.015 |
| French Community (Belgium)      | 0.890            | 0.996         | 0.989 | <b>0.115</b> | 0.021 |
| Brazil                          | 0.902            | 0.987         | 0.961 | <b>0.185</b> | 0.028 |
| Bulgaria                        | 0.925            | 1.000         | 0.999 | 0.047        | 0.008 |
| Chile                           | 0.911            | 1.000         | 1.000 | 0.019        | 0.008 |
| Colombia                        | 0.948            | 0.996         | 0.988 | <b>0.106</b> | 0.009 |
| Costa Rica                      | 0.928            | 0.996         | 0.989 | <b>0.119</b> | 0.018 |
| Croatia                         | 0.936            | 0.999         | 0.997 | 0.071        | 0.010 |
| Cyprus                          | 0.941            | 0.996         | 0.989 | <b>0.157</b> | 0.016 |
| Czechia                         | 0.896            | 0.999         | 0.997 | 0.056        | 0.011 |
| Denmark                         | 0.899            | 1.000         | 1.001 | 0.000        | 0.003 |
| Estonia                         | 0.912            | 0.999         | 0.998 | 0.052        | 0.010 |
| Finland                         | 0.873            | 0.999         | 0.997 | 0.045        | 0.012 |
| France                          | 0.885            | 1.000         | 0.999 | 0.027        | 0.009 |
| Hungary                         | 0.928            | 1.000         | 1.000 | 0.022        | 0.006 |
| Iceland                         | 0.895            | 1.000         | 0.999 | 0.028        | 0.007 |
| Israel                          | 0.924            | 0.998         | 0.993 | 0.090        | 0.011 |
| Italy                           | 0.930            | 1.000         | 0.999 | 0.037        | 0.005 |
| Japan                           | 0.934            | 0.997         | 0.992 | <b>0.145</b> | 0.016 |
| Kazakhstan                      | 0.944            | 0.998         | 0.994 | 0.090        | 0.011 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Korea                           | 0.926                           | 0.997         | 0.990 | <b>0.112</b> | 0.012 |
| Kosovo                          | 0.915                           | 0.994         | 0.981 | <b>0.123</b> | 0.026 |
| Latvia                          | 0.907                           | 0.995         | 0.985 | <b>0.111</b> | 0.021 |
| Lithuania                       | 0.909                           | 0.996         | 0.987 | <b>0.103</b> | 0.018 |
| Malta                           | 0.902                           | 1.000         | 0.999 | 0.029        | 0.007 |
| Montenegro                      | 0.949                           | 0.998         | 0.993 | <b>0.129</b> | 0.015 |
| Morocco                         | 0.895                           | 0.998         | 0.994 | 0.068        | 0.016 |
| Netherlands                     | 0.896                           | 1.000         | 1.002 | 0.000        | 0.003 |
| New Zealand                     | 0.898                           | 0.999         | 0.998 | 0.043        | 0.013 |
| North Macedonia                 | 0.937                           | 0.997         | 0.990 | <b>0.134</b> | 0.013 |
| Norway                          | 0.905                           | 0.998         | 0.993 | 0.081        | 0.015 |
| Poland                          | 0.926                           | 0.999         | 0.998 | 0.062        | 0.013 |
| Portugal                        | 0.907                           | 0.998         | 0.994 | 0.074        | 0.016 |
| Romania                         | 0.952                           | 0.999         | 0.997 | 0.074        | 0.009 |
| Saudi Arabia                    | 0.957                           | 0.997         | 0.991 | <b>0.156</b> | 0.010 |
| Serbia                          | 0.925                           | 0.998         | 0.993 | <b>0.116</b> | 0.018 |
| Shanghai (China)                | 0.951                           | 0.998         | 0.995 | <b>0.134</b> | 0.009 |
| Singapore                       | 0.923                           | 0.999         | 0.997 | 0.081        | 0.012 |
| Slovak Republic                 | 0.911                           | 1.000         | 0.999 | 0.040        | 0.008 |
| Slovenia                        | 0.909                           | 0.999         | 0.997 | 0.050        | 0.010 |
| South Africa                    | 0.917                           | 0.993         | 0.979 | <b>0.114</b> | 0.015 |
| Spain                           | 0.916                           | 0.999         | 0.998 | 0.042        | 0.010 |
| Sweden                          | 0.886                           | 0.999         | 0.998 | 0.035        | 0.010 |
| Türkiye                         | 0.934                           | 0.999         | 0.998 | 0.083        | 0.010 |
| United Arab Emirates            | 0.951                           | 0.999         | 0.998 | 0.042        | 0.006 |
| United States                   | 0.909                           | 0.999         | 0.997 | 0.047        | 0.014 |
| Uzbekistan                      | 0.939                           | 0.998         | 0.994 | 0.080        | 0.009 |
| Viet Nam                        | 0.955                           | 1.000         | 1.000 | 0.027        | 0.003 |
| International pooled data       | 0.917                           | 0.998         | 0.995 | 0.069        | 0.010 |
| <b>ISCED level 1</b>            |                                 |               |       |              |       |
| Australia                       | 0.904                           | 0.998         | 0.993 | 0.092        | 0.012 |
| Belgium                         | 0.919                           | 0.999         | 0.998 | 0.054        | 0.008 |
| Flemish Community (Belgium)     | 0.934                           | 1.000         | 0.999 | 0.048        | 0.007 |
| French Community (Belgium)      | 0.905                           | 1.000         | 1.000 | 0.024        | 0.005 |
| Brazil                          | 0.937                           | 0.995         | 0.986 | <b>0.155</b> | 0.018 |
| France                          | 0.934                           | 1.000         | 0.999 | 0.048        | 0.008 |
| Japan                           | 0.928                           | 0.994         | 0.982 | <b>0.191</b> | 0.020 |
| Korea                           | 0.922                           | 0.998         | 0.995 | 0.083        | 0.009 |
| Morocco                         | 0.908                           | 0.999         | 0.997 | 0.046        | 0.008 |
| Netherlands                     | 0.962                           | 0.999         | 0.998 | 0.076        | 0.010 |
| New Zealand                     | 0.937                           | 1.000         | 1.000 | 0.005        | 0.005 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Saudi Arabia                    | 0.957                           | 0.997         | 0.992 | <b>0.180</b> | 0.011 |
| Slovenia                        | 0.918                           | 0.999         | 0.997 | 0.068        | 0.009 |
| Spain                           | 0.920                           | 0.999         | 0.998 | 0.043        | 0.009 |
| Türkiye                         | 0.938                           | 1.000         | 1.000 | 0.019        | 0.004 |
| United Arab Emirates            | 0.945                           | 0.999         | 0.997 | 0.052        | 0.007 |
| International pooled data       | 0.929                           | 0.999         | 0.996 | 0.069        | 0.007 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.931                           | 0.999         | 0.998 | 0.056        | 0.007 |
| Denmark                         | 0.903                           | 0.996         | 0.989 | 0.077        | 0.017 |
| Flemish Community (Belgium)     | 0.916                           | 0.998         | 0.994 | 0.083        | 0.015 |
| Portugal                        | 0.897                           | 0.997         | 0.991 | 0.077        | 0.013 |
| Saudi Arabia                    | 0.961                           | 0.998         | 0.995 | <b>0.127</b> | 0.009 |
| Slovenia                        | 0.917                           | 0.999         | 0.998 | 0.050        | 0.009 |
| Türkiye                         | 0.933                           | 1.000         | 0.999 | 0.047        | 0.006 |
| United Arab Emirates            | 0.949                           | 0.999         | 0.996 | 0.050        | 0.008 |
| International pooled data       | 0.926                           | 1.000         | 0.999 | 0.025        | 0.003 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.198. Measurement invariance results from MGCFA for scale T4JOYTCH with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.998     | 0.995 | 0.082 | 0.012 | -                       | -      | -       | -      |
| Equal loadings                | 0.993     | 0.992 | 0.108 | 0.030 | -0.005                  | -0.003 | 0.026   | 0.018  |
| Equal loadings and thresholds | 0.990     | 0.995 | 0.088 | 0.128 | -0.004                  | 0.003  | -0.020  | 0.098  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), Hungary, Montenegro, the Netherlands, New Zealand, Norway and Sweden are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.199. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4JOYTCH**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| TT4G80A | 0.785   | -2.659      | -2.170      | -0.403      |
| TT4G80B | 0.919   | -2.532      | -1.620      | 0.068       |
| TT4G80C | 0.927   | -2.664      | -1.831      | 0.031       |
| TT4G80D | 0.824   | -2.332      | -1.356      | 0.238       |

Source: OECD, TALIS 2024 database.

### Complex scales from the principal questionnaire

#### Instructional leadership (principal) (T4PLEADS)

The principal scale of *Instructional leadership* (T4PLEADS) was measured by a set of three items (TC4G27D, TC4G27E and TC4G27F), described in Table 11.200. Principals had to report the frequency with which they performed different activities over the past year, using the following response categories: “Never or rarely”, “Sometimes”, “Often” and “Very often”. Higher values on this scale indicate more frequent instructional leadership activities, as perceived by principals.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.201. The model fit indices for T4PLEADS are not presented here as the scale was measured by just three items. As can be seen, scale reliabilities for T4PLEADS are greater than 0.700 in all populations.

Table 11.202 presents the results from the measurement invariance testing for T4PLEADS for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criterion for the RMSEA and is very close to the acceptable range for the CFI, TLI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.203 presents the standardised item loadings and thresholds based on pooled data for the scale T4PLEADS. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.200. Items and response categories used in the construction of scale T4PLEADS**

| Scale or item | Question or item wording                                                                                                                                                                                                                      |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4PLEADS      | Please indicate how frequently you engaged in the following activities in this school during the last 12 months.<br><i>Recoded response categories for scaling: 1=Never, rarely or sometimes; 2=Often; 3=Very often</i><br>Scale mid-point: 2 |
| TC4G27D       | I took actions to support co-operation among teachers to develop new teaching practices.                                                                                                                                                      |
| TC4G27E       | I took actions to ensure that teachers take responsibility for improving their teaching skills.                                                                                                                                               |
| TC4G27F       | I took actions to ensure that teachers feel responsible for their students' learning outcomes.                                                                                                                                                |

Source: OECD, TALIS 2024 database.

**Table 11.201. Reliability coefficient alpha for single countries and pooled model for scale T4PLEADS**

| Participating country/territory | Reliability<br>Cronbach's<br>alpha |
|---------------------------------|------------------------------------|
| <b>ISCED level 2</b>            |                                    |
| Albania                         | 0.840                              |
| Alberta (Canada)                | 0.910                              |
| Australia                       | 0.970                              |
| Austria                         | 0.848                              |
| Azerbaijan                      | 0.744                              |
| Bahrain                         | 0.947                              |
| Belgium                         | 0.894                              |
| Flemish Community (Belgium)     | 0.892                              |



| Participating country/territory | Reliability<br>Cronbach's<br>alpha |
|---------------------------------|------------------------------------|
| French Community (Belgium)      | 0.895                              |
| Brazil                          | 0.925                              |
| Bulgaria                        | 0.850                              |
| Chile                           | 0.943                              |
| Colombia                        | 0.916                              |
| Costa Rica                      | 0.886                              |
| Croatia                         | 0.895                              |
| Cyprus                          | 0.961                              |
| Czechia                         | 0.820                              |
| Denmark                         | 0.893                              |
| Estonia                         | 0.887                              |
| Finland                         | 0.865                              |
| France                          | 0.937                              |
| Hungary                         | 0.819                              |
| Iceland                         | 0.824                              |
| Israel                          | 0.878                              |
| Italy                           | 0.901                              |
| Japan                           | 0.914                              |
| Kazakhstan                      | 0.805                              |
| Korea                           | 0.869                              |
| Kosovo                          | 0.869                              |
| Latvia                          | 0.787                              |
| Lithuania                       | 0.879                              |
| Malta                           | 0.940                              |
| Montenegro                      | 0.933                              |
| Morocco                         | 0.894                              |
| Netherlands                     | 0.716                              |
| New Zealand                     | 0.801                              |
| North Macedonia                 | 0.909                              |
| Norway                          | 0.906                              |
| Poland                          | 0.886                              |
| Portugal                        | 0.898                              |
| Romania                         | 0.884                              |
| Saudi Arabia                    | 0.905                              |
| Serbia                          | 0.874                              |
| Shanghai (China)                | 0.947                              |
| Singapore                       | 0.953                              |
| Slovak Republic                 | 0.837                              |
| Slovenia                        | 0.869                              |
| South Africa                    | 0.890                              |

| Participating country/territory | Reliability<br>Cronbach's<br>alpha |
|---------------------------------|------------------------------------|
| Spain                           | 0.858                              |
| Sweden                          | 0.899                              |
| Türkiye                         | 0.913                              |
| United Arab Emirates            | 0.928                              |
| United States                   | 0.884                              |
| Uzbekistan                      | 0.706                              |
| Viet Nam                        | 0.923                              |
| International pooled data       | 0.898                              |
| <b>ISCED level 1</b>            |                                    |
| Australia                       | 0.912                              |
| Belgium                         | 0.918                              |
| Flemish Community (Belgium)     | 0.912                              |
| French Community (Belgium)      | 0.931                              |
| Brazil                          | 0.835                              |
| France                          | 0.888                              |
| Japan                           | 0.919                              |
| Korea                           | 0.940                              |
| Morocco                         | 0.836                              |
| Netherlands                     | 0.734                              |
| New Zealand                     | 0.913                              |
| Saudi Arabia                    | 0.909                              |
| Slovenia                        | 0.821                              |
| Spain                           | 0.851                              |
| Türkiye                         | 0.907                              |
| United Arab Emirates            | 0.923                              |
| International pooled data       | 0.901                              |
| <b>ISCED level 3</b>            |                                    |
| Croatia                         | 0.945                              |
| Denmark                         | 0.866                              |
| Flemish Community (Belgium)     | 0.880                              |
| Portugal                        | 0.797                              |
| Saudi Arabia                    | 0.912                              |
| Slovenia                        | 0.864                              |
| Türkiye                         | 0.933                              |
| United Arab Emirates            | 0.931                              |
| International pooled data       | 0.917                              |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.202. Measurement invariance results from MGCFA for scale T4PLEADS with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.998     | 0.997 | 0.067 | 0.022 | -0.002                  | -0.003 | 0.067   | 0.022  |
| Equal loadings and thresholds | 0.989     | 0.992 | 0.108 | 0.086 | -0.009                  | -0.005 | 0.042   | 0.064  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.203. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PLEADS**

| Item    | Slope | Threshold 1 | Threshold 2 |
|---------|-------|-------------|-------------|
| TC4G27D | 0.792 | -0.480      | 0.805       |
| TC4G27E | 0.962 | -0.527      | 0.794       |
| TC4G27F | 0.851 | -0.661      | 0.688       |

Source: OECD, TALIS 2024 database.

### Teacher leadership (principal) (T4PTLEAD)

The scale of *Teacher leadership* (T4PTLEAD), as reported by principals, consisted of four items (TC4G29A, TC4G29B, TC4G29C and TC4G29D), which measured principals' agreement with different statements about leadership roles and practices of teachers at their school. Responses were provided on a four-point scale: "Strongly disagree", "Disagree", "Agree" and "Strongly agree". Higher values on this scale reflect a greater extent of teacher leadership within the school, as perceived by principals. Table 11.204 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.205. As can be seen, reliability for T4PTLEAD is high in most countries/territories, with none of them below the established cut-off criteria in any ISCED level. In terms of model fit, the CFI is at least within the acceptable range in almost all populations, except for the ISCED level 2 population in Latvia, where it is particularly low. The TLI exceeds the cut-off criterion in six participating countries/territories: the ISCED level 2 population in Austria, Israel, Kazakhstan, Latvia and the Slovak Republic, and in the ISCED level 3 population in Slovenia. The RMSEA exceeds the cut-off criterion in 20 of the ISCED level 2 participants, particularly in Colombia, Israel and Latvia; in 5 ISCED level 1 participants (Belgium, the Flemish Community of Belgium, Slovenia, Spain and Türkiye); and in 3 ISCED level 3 participants (Croatia, Slovenia and Türkiye). The RMSEA of the international pooled data for ISCED level 3 also exceeds the cut-off. Finally, the SRMR exceeds the cut-off only in the ISCED level 2 population in Latvia. Based on the single CFA model fit results, the scale T4PTLEAD works well across all populations except in Latvia (ISCED level 2), where none of the fit indices reach the acceptable criteria.

Table 11.206 presents the results from the measurement invariance testing for T4PTLEAD for the ISCED level 2 population. The baseline model shows an acceptable model fit, as the CFI, TLI and SRMR are within the cut-off criteria and the RMSEA is very close. The degree of change between the baseline and the equal loadings model is within the cut-off criteria for the RMSEA and SRMR, very close for the TLI and close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds

models is within the cut-off criteria for the TLI and RMSEA, close to the acceptable range for the CFI, but exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.207 presents the standardised item loadings and thresholds based on pooled data for the scale T4PTLEAD. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.204. Items and response categories used in the construction of scale T4PTLEAD**

| Scale or item | Question or item wording                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------|
| T4PTLEAD      | How strongly do you agree or disagree with these statements about teachers at this school?                 |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree or disagree; 2=Agree; 3=Strongly agree</i> |
|               | Scale mid-point: 2                                                                                         |
| TC4G29A       | Teachers take leadership roles in promoting a professional learning community.                             |
| TC4G29B       | Teachers initiate and lead collaborative activities.                                                       |
| TC4G29C       | Teachers lead their professional growth and development activities whenever possible.                      |
| TC4G29D       | Teachers participate in non-teaching school events and projects.                                           |

Source: OECD, TALIS 2024 database.

**Table 11.205. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4PTLEAD**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| <b>ISCED level 2</b>            |                  |               |              |              |       |
| Albania                         | 0.834            | 1.000         | 1.007        | 0.000        | 0.012 |
| Alberta (Canada)                | 0.937            | 0.991         | 0.972        | <b>0.161</b> | 0.033 |
| Australia                       | 0.882            | 0.989         | 0.966        | <b>0.160</b> | 0.048 |
| Austria                         | 0.750            | 0.955         | <b>0.864</b> | <b>0.155</b> | 0.054 |
| Azerbaijan                      | 0.705            | 0.999         | 0.996        | 0.018        | 0.022 |
| Bahrain                         | 0.947            | 1.000         | 1.003        | 0.000        | 0.012 |
| Belgium                         | 0.724            | 0.990         | 0.970        | 0.061        | 0.031 |
| Flemish Community (Belgium)     | 0.786            | 0.981         | 0.943        | <b>0.107</b> | 0.041 |
| French Community (Belgium)      | 0.732            | 1.000         | 1.046        | 0.000        | 0.022 |
| Brazil                          | 0.826            | 0.998         | 0.995        | 0.067        | 0.027 |
| Bulgaria                        | 0.856            | 0.985         | 0.955        | <b>0.146</b> | 0.047 |
| Chile                           | 0.927            | 0.998         | 0.995        | 0.100        | 0.024 |
| Colombia                        | 0.897            | 0.994         | 0.981        | <b>0.249</b> | 0.043 |
| Costa Rica                      | 0.935            | 0.995         | 0.984        | <b>0.143</b> | 0.022 |
| Croatia                         | 0.874            | 0.991         | 0.973        | <b>0.108</b> | 0.039 |
| Cyprus                          | 0.843            | 0.979         | 0.937        | <b>0.194</b> | 0.056 |
| Czechia                         | 0.730            | 0.997         | 0.992        | 0.031        | 0.022 |
| Denmark                         | 0.879            | 0.993         | 0.979        | 0.099        | 0.034 |
| Estonia                         | 0.871            | 1.000         | 1.008        | 0.000        | 0.008 |
| Finland                         | 0.751            | 0.991         | 0.974        | 0.068        | 0.033 |
| France                          | 0.768            | 0.995         | 0.986        | 0.051        | 0.027 |
| Hungary                         | 0.826            | 1.000         | 1.004        | 0.000        | 0.016 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |               |              |              |
|---------------------------------|---------------------------------|---------------|---------------|--------------|--------------|
|                                 |                                 | CFI           | TLI           | RMSEA        | SRMR         |
| Iceland                         | 0.897                           | 1.000         | 1.006         | 0.000        | 0.011        |
| Israel                          | 0.804                           | 0.957         | <b>0.870</b>  | <b>0.211</b> | 0.061        |
| Italy                           | 0.806                           | 0.979         | 0.937         | <b>0.133</b> | 0.035        |
| Japan                           | 0.760                           | 0.997         | 0.992         | 0.051        | 0.029        |
| Kazakhstan                      | 0.701                           | 0.935         | <b>0.805</b>  | <b>0.104</b> | 0.079        |
| Korea                           | 0.985                           | 1.000         | 1.000         | 0.000        | 0.010        |
| Kosovo                          | 0.877                           | 0.991         | 0.974         | <b>0.116</b> | 0.029        |
| Latvia                          | 0.689                           | <b>0.414</b>  | <b>-0.757</b> | <b>0.469</b> | <b>0.158</b> |
| Lithuania                       | 0.814                           | 0.989         | 0.967         | 0.085        | 0.042        |
| Malta                           | 0.926                           | 0.995         | 0.985         | <b>0.174</b> | 0.018        |
| Montenegro                      | 0.910                           | 0.996         | 0.988         | <b>0.126</b> | 0.024        |
| Morocco                         | 0.867                           | 0.996         | 0.987         | 0.063        | 0.030        |
| Netherlands                     | 0.710                           | 0.992         | 0.975         | <b>0.156</b> | 0.063        |
| New Zealand                     | 0.880                           | 0.992         | 0.977         | 0.066        | 0.038        |
| North Macedonia                 | 0.903                           | 1.000         | 1.004         | 0.000        | 0.003        |
| Norway                          | 0.831                           | 1.000         | 1.000         | 0.004        | 0.022        |
| Poland                          | 0.839                           | 0.990         | 0.971         | 0.090        | 0.031        |
| Portugal                        | 0.813                           | 0.997         | 0.992         | 0.037        | 0.026        |
| Romania                         | 0.818                           | 1.000         | 1.007         | 0.000        | 0.012        |
| Saudi Arabia                    | 0.923                           | 0.993         | 0.978         | <b>0.160</b> | 0.026        |
| Serbia                          | 0.838                           | 0.992         | 0.977         | 0.093        | 0.032        |
| Shanghai (China)                | 0.898                           | 1.000         | 0.999         | 0.067        | 0.020        |
| Singapore                       | 0.919                           | 0.999         | 0.998         | 0.084        | 0.022        |
| Slovak Republic                 | 0.750                           | 0.952         | <b>0.856</b>  | <b>0.149</b> | 0.051        |
| Slovenia                        | 0.826                           | 0.996         | 0.989         | 0.061        | 0.025        |
| South Africa                    | 0.889                           | 0.997         | 0.991         | 0.085        | 0.023        |
| Spain                           | 0.853                           | 0.980         | 0.939         | <b>0.104</b> | 0.044        |
| Sweden                          | 0.859                           | 0.993         | 0.979         | 0.100        | 0.035        |
| Türkiye                         | 0.949                           | 0.999         | 0.997         | 0.065        | 0.015        |
| United Arab Emirates            | 0.899                           | 1.000         | 1.003         | 0.000        | 0.008        |
| United States                   | 0.941                           | 1.000         | 1.003         | 0.000        | 0.003        |
| Uzbekistan                      | 0.717                           | 1.000         | 1.037         | 0.000        | 0.009        |
| Viet Nam                        | 0.827                           | 1.000         | 1.001         | 0.000        | 0.018        |
| International pooled data       | 0.846                           | 0.992         | 0.977         | 0.089        | 0.021        |
| ISCED level 1                   |                                 |               |               |              |              |
| Australia                       | 0.913                           | 0.995         | 0.984         | 0.099        | 0.031        |
| Belgium                         | 0.775                           | 0.984         | 0.951         | <b>0.112</b> | 0.037        |
| Flemish Community (Belgium)     | 0.830                           | 0.987         | 0.961         | <b>0.137</b> | 0.046        |
| French Community (Belgium)      | 0.677                           | 0.974         | 0.921         | 0.092        | 0.043        |
| Brazil                          | 0.854                           | 0.998         | 0.995         | 0.054        | 0.023        |
| France                          | 0.787                           | 0.996         | 0.988         | 0.056        | 0.021        |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Japan                           | 0.822                           | 1.000         | 1.008        | 0.000        | 0.015 |
| Korea                           | 0.977                           | 1.000         | 1.002        | 0.000        | 0.001 |
| Morocco                         | 0.890                           | 0.999         | 0.997        | 0.040        | 0.016 |
| Netherlands                     | 0.836                           | 1.000         | 1.006        | 0.000        | 0.014 |
| New Zealand                     | 0.843                           | 0.993         | 0.979        | 0.097        | 0.037 |
| Saudi Arabia                    | 0.897                           | 0.996         | 0.987        | 0.099        | 0.025 |
| Slovenia                        | 0.816                           | 0.987         | 0.961        | <b>0.107</b> | 0.036 |
| Spain                           | 0.867                           | 0.989         | 0.966        | <b>0.120</b> | 0.037 |
| Türkiye                         | 0.942                           | 0.992         | 0.975        | <b>0.270</b> | 0.044 |
| United Arab Emirates            | 0.931                           | 1.000         | 1.001        | 0.000        | 0.006 |
| International pooled data       | 0.860                           | 0.996         | 0.987        | 0.086        | 0.017 |
| <b>ISCED level 3</b>            |                                 |               |              |              |       |
| Croatia                         | 0.866                           | 0.988         | 0.965        | <b>0.129</b> | 0.054 |
| Denmark                         | 0.872                           | 0.998         | 0.993        | 0.083        | 0.034 |
| Flemish Community (Belgium)     | 0.889                           | 0.999         | 0.997        | 0.039        | 0.020 |
| Portugal                        | 0.850                           | 0.995         | 0.985        | 0.071        | 0.023 |
| Saudi Arabia                    | 0.928                           | 0.999         | 0.996        | 0.060        | 0.015 |
| Slovenia                        | 0.808                           | 0.952         | <b>0.857</b> | <b>0.212</b> | 0.089 |
| Türkiye                         | 0.922                           | 0.991         | 0.972        | <b>0.206</b> | 0.048 |
| United Arab Emirates            | 0.922                           | 0.997         | 0.990        | 0.100        | 0.025 |
| International pooled data       | 0.894                           | 0.993         | 0.978        | <b>0.121</b> | 0.027 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.206. Measurement invariance results from MGCFA for scale T4PTLEAD with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.996     | 0.987 | 0.107 | 0.032 | -                       | -      | -       | -      |
| Equal loadings                | 0.985     | 0.982 | 0.127 | 0.067 | -0.011                  | -0.005 | 0.020   | 0.035  |
| Equal loadings and thresholds | 0.972     | 0.978 | 0.138 | 0.153 | -0.013                  | -0.003 | 0.011   | 0.087  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), Bulgaria, the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.207. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PTLEAD**

| Item    | Slope | Threshold 1 | Threshold 2 |
|---------|-------|-------------|-------------|
| TC4G29A | 0.783 | -1.102      | 0.693       |
| TC4G29B | 0.896 | -1.417      | 0.552       |
| TC4G29C | 0.799 | -1.306      | 0.552       |
| TC4G29D | 0.601 | -1.201      | 0.503       |

Source: OECD, TALIS 2024 database.

### Opportunities to participate in school decisions (principal) (T4POPPART)

Principals were asked to answer three items measuring *Opportunities to participate in school decisions* (T4POPPART). These items were TC4G38A, TC4G38B and TC4G38C. All items were answered on a four-point scale, with response categories of “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale indicate greater perceived opportunities given to various stakeholders to participate in school decision making.

Table 11.208 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.209. The model fit indices for T4POPPART are not presented here as the scale was measured by just three items. Scale reliabilities for T4POPPART are generally high (above 0.700), except for the ISCED level 1 population in the Netherlands, where it does not reach the acceptable cut-off criterion.

Table 11.210 presents the results from the measurement invariance testing for T4POPPART for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models meets the cut-off criterion for the RMSEA, is close to the acceptable range for the TLI and CFI, but exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.211 presents the standardised item loadings and thresholds based on pooled data for the scale T4POPPART. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.208. Items and response categories used in the construction of scale T4POPPART**

| Scale or item | Question or item wording                                                                                  |
|---------------|-----------------------------------------------------------------------------------------------------------|
| T4POPPART     | How strongly do you agree or disagree with these statements as applied to this school?                    |
|               | Recoded response categories for scaling: 1=Strongly disagree or disagree; 2=Agree; 3=Strongly agree       |
|               | Scale mid-point: 2                                                                                        |
| TC4G38A       | This school provides staff with opportunities to actively participate in school decisions.                |
| TC4G38B       | This school provides parents or guardians with opportunities to actively participate in school decisions. |
| TC4G38C       | This school provides students with opportunities to actively participate in school decisions.             |

Source: OECD, TALIS 2024 database.

**Table 11.209. Reliability coefficient alpha for single countries and pooled model for scale T4POPPART**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.895                           |
| Alberta (Canada)                | 0.864                           |
| Australia                       | 0.841                           |
| Austria                         | 0.868                           |
| Azerbaijan                      | 0.778                           |
| Bahrain                         | 0.950                           |
| Belgium                         | 0.938                           |
| Flemish Community (Belgium)     | 0.937                           |
| French Community (Belgium)      | 0.908                           |
| Brazil                          | 0.919                           |
| Bulgaria                        | 0.878                           |
| Chile                           | 0.933                           |
| Colombia                        | 0.924                           |
| Costa Rica                      | 0.865                           |
| Croatia                         | 0.925                           |
| Cyprus                          | 0.915                           |
| Czechia                         | 0.809                           |
| Denmark                         | 0.768                           |
| Estonia                         | 0.786                           |
| Finland                         | 0.797                           |
| France                          | 0.874                           |
| Hungary                         | 0.838                           |
| Iceland                         | 0.861                           |
| Israel                          | 0.899                           |
| Italy                           | 0.718                           |
| Japan                           | 0.755                           |
| Kazakhstan                      | 0.864                           |
| Korea                           | 0.944                           |
| Kosovo                          | 0.908                           |
| Latvia                          | 0.835                           |
| Lithuania                       | 0.975                           |
| Malta                           | 0.935                           |
| Montenegro                      | 0.904                           |
| Morocco                         | 0.852                           |
| Netherlands                     | 0.886                           |
| New Zealand                     | 0.799                           |
| North Macedonia                 | 0.934                           |
| Norway                          | 0.925                           |



| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Poland                          | 0.953                           |
| Portugal                        | 0.942                           |
| Romania                         | 0.881                           |
| Saudi Arabia                    | 0.900                           |
| Serbia                          | 0.962                           |
| Shanghai (China)                | 0.960                           |
| Singapore                       | 0.813                           |
| Slovak Republic                 | 0.857                           |
| Slovenia                        | 0.713                           |
| South Africa                    | 0.929                           |
| Spain                           | 0.891                           |
| Sweden                          | 0.743                           |
| Türkiye                         | 0.933                           |
| United Arab Emirates            | 0.942                           |
| United States                   | 0.906                           |
| Uzbekistan                      | 0.850                           |
| Viet Nam                        | 0.827                           |
| International pooled data       | 0.879                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.867                           |
| Belgium                         | 0.742                           |
| Flemish Community (Belgium)     | 0.720                           |
| French Community (Belgium)      | 0.772                           |
| Brazil                          | 0.867                           |
| France                          | 0.791                           |
| Japan                           | 0.781                           |
| Korea                           | 0.932                           |
| Morocco                         | 0.885                           |
| Netherlands                     | <b>0.554</b>                    |
| New Zealand                     | 0.976                           |
| Saudi Arabia                    | 0.904                           |
| Slovenia                        | 0.790                           |
| Spain                           | 0.832                           |
| Türkiye                         | 0.853                           |
| United Arab Emirates            | 0.934                           |
| International pooled data       | 0.832                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.956                           |
| Denmark                         | 0.629                           |
| Flemish Community (Belgium)     | 0.886                           |
| Portugal                        | 0.912                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Saudi Arabia                    | 0.918                           |
| Slovenia                        | 0.960                           |
| Türkiye                         | 0.890                           |
| United Arab Emirates            | 0.953                           |
| International pooled data       | 0.885                           |

Note: Coefficients in **bold** exceed the cut-off criterion. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.210. Measurement invariance results from MGCFA for scale T4POPPART with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.996     | 0.994 | 0.101 | 0.035 | -0.004                  | -0.006 | 0.101   | 0.035  |
| Equal loadings and thresholds | 0.981     | 0.986 | 0.150 | 0.157 | -0.014                  | -0.008 | 0.049   | 0.122  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), Estonia, Iceland, Korea, Lithuania, the Netherlands, New Zealand, Norway, Serbia and Slovenia are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.211. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4POPPART**

| Item    | Slope | Threshold 1 | Threshold 2 |
|---------|-------|-------------|-------------|
| TC4G38A | 0.751 | -2.054      | 0.144       |
| TC4G38B | 0.917 | -1.002      | 0.724       |
| TC4G38C | 0.857 | -1.104      | 0.770       |

Source: OECD, TALIS 2024 database.

### Academic rigor (T4PACADT)

The scale of *Academic rigor* (T4PACADT) was measured by a set of three items (TC4G39A, TC4G39B and TC4G39C), shown in Table 11.212. These items assess principals' views on teachers' understanding and implementation of the curriculum, as well as on teachers' expectations of student achievement. Principals were asked to indicate the extent to which these statements apply in their school, using the following response categories: "Not at all", "To some extent", "Quite a bit" and "A lot". Higher values on this scale indicate greater perceived academic rigor.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.213. The model fit indices for T4PACADT are not presented here as the scale was measured by just three items. Scale reliabilities for T4PACADT are generally high, except for the ISCED level 2 population in Croatia and Latvia where the reliability exceeds the cut-off criterion.

Table 11.214 presents the results from the measurement invariance testing for T4PACADT for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The equal loadings model is within the cut-off criteria for the CFI, TLI, SRMR and very close for the RMSEA. The degree of change between the equal loadings and the equal loadings and thresholds models is very close to the acceptable cut-off criterion for the RMSEA but exceeds the cut-off criteria for the CFI, TLI and SRMR. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

Table 11.215 presents the standardised item loadings and thresholds based on pooled data for the scale T4PACADT. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.212. Items and response categories used in the construction of scale T4PACADT**

| Scale or item | Question or item wording                                                                               |
|---------------|--------------------------------------------------------------------------------------------------------|
| T4PACADT      | To what extent do the following statements apply to this school?                                       |
|               | <i>Recoded response categories for scaling: 1=Not at all or to some extent; 2=Quite a bit; 3=A lot</i> |
|               | Scale mid-point: 2                                                                                     |
| TC4G39A       | Teachers understand the curricular goals.                                                              |
| TC4G39B       | Teachers succeed in implementing the curriculum.                                                       |
| TC4G39C       | Teachers hold high expectations for student achievement.                                               |

Source: OECD, TALIS 2024 database.

**Table 11.213. Reliability coefficient alpha for single countries and pooled model for scale T4PACADT**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.772                           |
| Alberta (Canada)                | 0.797                           |
| Australia                       | 0.834                           |
| Austria                         | 0.664                           |
| Azerbaijan                      | 0.881                           |
| Bahrain                         | 0.895                           |
| Belgium                         | 0.798                           |
| Flemish Community (Belgium)     | 0.816                           |
| French Community (Belgium)      | 0.706                           |
| Brazil                          | 0.850                           |
| Bulgaria                        | 0.725                           |
| Chile                           | 0.885                           |
| Colombia                        | 0.752                           |
| Costa Rica                      | 0.898                           |
| Croatia                         | <b>0.589</b>                    |
| Cyprus                          | 0.888                           |
| Czechia                         | 0.683                           |
| Denmark                         | 0.771                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Estonia                         | 0.690                           |
| Finland                         | 0.778                           |
| France                          | 0.738                           |
| Hungary                         | 0.673                           |
| Iceland                         | 0.870                           |
| Israel                          | 0.778                           |
| Italy                           | 0.787                           |
| Japan                           | 0.645                           |
| Kazakhstan                      | 0.814                           |
| Korea                           | 0.908                           |
| Kosovo                          | 0.822                           |
| Latvia                          | <b>0.593</b>                    |
| Lithuania                       | 0.815                           |
| Malta                           | 0.920                           |
| Montenegro                      | 0.779                           |
| Morocco                         | 0.873                           |
| Netherlands                     | 0.661                           |
| New Zealand                     | 0.853                           |
| North Macedonia                 | 0.854                           |
| Norway                          | 0.810                           |
| Poland                          | 0.746                           |
| Portugal                        | 0.764                           |
| Romania                         | 0.863                           |
| Saudi Arabia                    | 0.871                           |
| Serbia                          | 0.787                           |
| Shanghai (China)                | 0.931                           |
| Singapore                       | 0.831                           |
| Slovak Republic                 | 0.767                           |
| Slovenia                        | 0.688                           |
| South Africa                    | 0.866                           |
| Spain                           | 0.814                           |
| Sweden                          | 0.879                           |
| Türkiye                         | 0.898                           |
| United Arab Emirates            | 0.929                           |
| United States                   | 0.938                           |
| Uzbekistan                      | 0.747                           |
| Viet Nam                        | 0.829                           |
| International pooled data       | 0.830                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.905                           |
| Belgium                         | 0.793                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Flemish Community (Belgium)     | 0.850                           |
| French Community (Belgium)      | 0.657                           |
| Brazil                          | 0.824                           |
| France                          | 0.805                           |
| Japan                           | 0.812                           |
| Korea                           | 0.904                           |
| Morocco                         | 0.836                           |
| Netherlands                     | 0.772                           |
| New Zealand                     | 0.908                           |
| Saudi Arabia                    | 0.869                           |
| Slovenia                        | 0.664                           |
| Spain                           | 0.846                           |
| Türkiye                         | 0.819                           |
| United Arab Emirates            | 0.920                           |
| International pooled data       | 0.841                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.742                           |
| Denmark                         | 0.736                           |
| Flemish Community (Belgium)     | 0.854                           |
| Portugal                        | 0.760                           |
| Saudi Arabia                    | 0.973                           |
| Slovenia                        | 0.699                           |
| Türkiye                         | 0.869                           |
| United Arab Emirates            | 0.901                           |
| International pooled data       | 0.864                           |

Note: Coefficients in **bold** exceed the cut-off criterion. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.214. Measurement invariance results from MGCFA for scale T4PACADT with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.989     | 0.983 | 0.108 | 0.051 | -0.011                  | -0.017 | 0.108   | 0.051  |
| Equal loadings and thresholds | 0.949     | 0.961 | 0.163 | 0.146 | -0.040                  | -0.022 | 0.055   | 0.095  |

Note: Albania, Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), Latvia, the Netherlands, New Zealand, Norway and Viet Nam are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.215. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PACADT**

| Item    | Slope | Threshold 1 | Threshold 2 |
|---------|-------|-------------|-------------|
| TC4G39A | 0.816 | -1.482      | 0.037       |
| TC4G39B | 0.927 | -1.376      | 0.167       |
| TC4G39C | 0.633 | -0.933      | 0.401       |

Source: OECD, TALIS 2024 database.

### School delinquency and violence (T4PDELI)

The scale of *School delinquency and violence* (T4PDELI) was measured by four items (TC4G41A, TC4G41B, TC4G41D and TC4G41E). For these items, principals were asked to report how frequently different situations occurred among students, using the following response categories: “Never”, “Less than monthly”, “Monthly”, “Weekly” and “Daily”. Higher scores on this scale indicate more frequent delinquent or violent situations at school, as perceived by principals. Table 11.216 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.217. Scale reliabilities for T4PDELI are high, generally above 0.800, across all countries/territories. As can be observed from Table 11.217, the CFI for T4PDELI is within the acceptable cut-off for all participating countries/territories. The TLI exceeds the cut-off criterion in the ISCED level 2 population in Saudi Arabia, Singapore and Slovenia. The RMSEA is mostly acceptable across all populations, except in 11 ISCED level 2 participants. From these, it particularly exceeds the cut-off criterion in the Flemish Community of Belgium, Japan, Saudi Arabia, Singapore and Slovenia. The SRMR exceeds the cut-off criterion only in the ISCED level 2 population in the Netherlands.

Table 11.218 presents the results from the measurement invariance testing for T4PDELI for the ISCED level 2 population. The baseline model shows an acceptable model fit across all indices. The degree of change between the baseline and the equal loadings model is within the cut-off criteria for all indices. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-offs for all indices. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

Table 11.219 presents the standardised item loadings and thresholds based on pooled data for the scale T4PDELI. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.216. Items and response categories used in the construction of scale T4PDELI**

| Scale or item | Question or item wording                                                                                 |
|---------------|----------------------------------------------------------------------------------------------------------|
| T4PDELI       | In this school, how often do the following occur amongst students?                                       |
|               | <i>Recoded response categories for scaling: 1=Never; 2=Less than monthly; 3=Monthly, weekly or daily</i> |
|               | Scale mid-point: 2                                                                                       |
| TC4G41A       | Vandalism and theft                                                                                      |
| TC4G41B       | Intimidation or bullying among students (or other forms of verbal abuse) on school grounds               |
| TC4G41D       | Physical injury caused by violence among students                                                        |
| TC4G41E       | Intimidation or verbal abuse of teachers or staff on school grounds                                      |

Source: OECD, TALIS 2024 database.

**Table 11.217. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4PDELI**

| Participating country/territory | Reliability      | CFA model fit |       |              |              |
|---------------------------------|------------------|---------------|-------|--------------|--------------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR         |
| ISCED level 2                   |                  |               |       |              |              |
| Albania                         | 0.828            | 1.000         | 1.037 | 0.000        | 0.009        |
| Alberta (Canada)                | 0.893            | 1.000         | 1.007 | 0.000        | 0.010        |
| Australia                       | 0.930            | 0.998         | 0.994 | 0.080        | 0.022        |
| Austria                         | 0.822            | 0.999         | 0.996 | 0.026        | 0.025        |
| Azerbaijan                      | 0.929            | 0.993         | 0.978 | 0.087        | 0.032        |
| Bahrain                         | 0.888            | 1.000         | 1.004 | 0.000        | 0.020        |
| Belgium                         | 0.852            | 0.986         | 0.958 | 0.095        | 0.035        |
| Flemish Community (Belgium)     | 0.889            | 0.970         | 0.910 | <b>0.152</b> | 0.059        |
| French Community (Belgium)      | 0.762            | 0.997         | 0.992 | 0.033        | 0.041        |
| Brazil                          | 0.869            | 1.000         | 0.999 | 0.015        | 0.014        |
| Bulgaria                        | 0.895            | 1.000         | 1.005 | 0.000        | 0.011        |
| Chile                           | 0.812            | 0.973         | 0.918 | 0.093        | 0.050        |
| Colombia                        | 0.928            | 0.999         | 0.996 | 0.059        | 0.017        |
| Costa Rica                      | 0.838            | 0.995         | 0.984 | <b>0.108</b> | 0.039        |
| Croatia                         | 0.886            | 1.000         | 1.010 | 0.000        | 0.008        |
| Cyprus                          | 0.876            | 0.994         | 0.981 | <b>0.106</b> | 0.037        |
| Czechia                         | 0.832            | 1.000         | 1.006 | 0.000        | 0.013        |
| Denmark                         | 0.871            | 0.994         | 0.982 | 0.088        | 0.023        |
| Estonia                         | 0.823            | 1.000         | 1.020 | 0.000        | 0.009        |
| Finland                         | 0.860            | 1.000         | 1.032 | 0.000        | 0.007        |
| France                          | 0.833            | 0.993         | 0.979 | 0.078        | 0.034        |
| Hungary                         | 0.847            | 0.986         | 0.957 | <b>0.108</b> | 0.034        |
| Iceland                         | 0.822            | 1.000         | 1.036 | 0.000        | 0.006        |
| Israel                          | 0.880            | 0.997         | 0.992 | 0.057        | 0.025        |
| Italy                           | 0.813            | 1.000         | 1.022 | 0.000        | 0.008        |
| Japan                           | 0.844            | 0.978         | 0.934 | <b>0.164</b> | 0.047        |
| Kazakhstan                      | 0.862            | 0.986         | 0.958 | 0.076        | 0.057        |
| Korea                           | 0.869            | 1.000         | 1.000 | 0.010        | 0.018        |
| Kosovo                          | 0.639            | 0.969         | 0.907 | 0.073        | 0.058        |
| Latvia                          | 0.860            | 1.000         | 0.999 | 0.018        | 0.025        |
| Lithuania                       | 0.835            | 0.997         | 0.991 | 0.039        | 0.027        |
| Malta                           | 0.903            | 0.999         | 0.997 | 0.043        | 0.042        |
| Montenegro                      | 0.897            | 1.000         | 1.015 | 0.000        | 0.003        |
| Morocco                         | 0.888            | 1.000         | 0.999 | 0.014        | 0.020        |
| Netherlands                     | 0.855            | 1.000         | 1.073 | 0.000        | <b>0.164</b> |
| New Zealand                     | 0.822            | 1.000         | 1.029 | 0.000        | 0.012        |
| North Macedonia                 | 0.891            | 1.000         | 0.999 | 0.021        | 0.023        |
| Norway                          | 0.846            | 0.979         | 0.937 | <b>0.113</b> | 0.056        |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Poland                          | 0.837                           | 1.000         | 1.006        | 0.000        | 0.018 |
| Portugal                        | 0.856                           | 0.994         | 0.981        | 0.076        | 0.032 |
| Romania                         | 0.882                           | 0.988         | 0.965        | <b>0.121</b> | 0.049 |
| Saudi Arabia                    | 0.848                           | 0.956         | <b>0.867</b> | <b>0.176</b> | 0.065 |
| Serbia                          | 0.894                           | 1.000         | 1.002        | 0.000        | 0.012 |
| Shanghai (China)                | 0.901                           | 1.000         | 1.014        | 0.000        | 0.007 |
| Singapore                       | 0.798                           | 0.964         | <b>0.893</b> | <b>0.138</b> | 0.054 |
| Slovak Republic                 | 0.848                           | 1.000         | 1.008        | 0.000        | 0.011 |
| Slovenia                        | 0.813                           | 0.966         | <b>0.897</b> | <b>0.148</b> | 0.065 |
| South Africa                    | 0.806                           | 0.993         | 0.979        | 0.058        | 0.030 |
| Spain                           | 0.865                           | 1.000         | 1.000        | 0.004        | 0.018 |
| Sweden                          | 0.791                           | 1.000         | 1.011        | 0.000        | 0.028 |
| Türkiye                         | 0.870                           | 0.987         | 0.961        | <b>0.110</b> | 0.037 |
| United Arab Emirates            | 0.884                           | 1.000         | 1.005        | 0.000        | 0.019 |
| United States                   | 0.800                           | 0.998         | 0.994        | 0.030        | 0.032 |
| Uzbekistan                      | 0.935                           | 0.996         | 0.989        | 0.076        | 0.027 |
| Viet Nam                        | 0.849                           | 0.991         | 0.972        | 0.082        | 0.053 |
| International pooled data       | 0.902                           | 0.999         | 0.997        | 0.034        | 0.008 |
| <b>ISCED level 1</b>            |                                 |               |              |              |       |
| Australia                       | 0.863                           | 1.000         | 1.019        | 0.000        | 0.009 |
| Belgium                         | 0.800                           | 0.990         | 0.971        | 0.075        | 0.026 |
| Flemish Community (Belgium)     | 0.760                           | 0.983         | 0.949        | <b>0.102</b> | 0.041 |
| French Community (Belgium)      | 0.828                           | 1.000         | 1.017        | 0.000        | 0.012 |
| Brazil                          | 0.890                           | 1.000         | 1.008        | 0.000        | 0.004 |
| France                          | 0.845                           | 0.992         | 0.976        | 0.085        | 0.029 |
| Japan                           | 0.881                           | 0.996         | 0.987        | 0.078        | 0.022 |
| Korea                           | 0.871                           | 0.995         | 0.986        | 0.054        | 0.028 |
| Morocco                         | 0.823                           | 0.997         | 0.990        | 0.041        | 0.027 |
| Netherlands                     | 0.812                           | 1.000         | 1.024        | 0.000        | 0.015 |
| New Zealand                     | 0.838                           | 0.997         | 0.992        | 0.047        | 0.025 |
| Saudi Arabia                    | 0.875                           | 0.990         | 0.971        | <b>0.106</b> | 0.058 |
| Slovenia                        | 0.860                           | 0.988         | 0.963        | <b>0.118</b> | 0.037 |
| Spain                           | 0.869                           | 0.998         | 0.995        | 0.031        | 0.019 |
| Türkiye                         | 0.856                           | 0.992         | 0.976        | 0.083        | 0.032 |
| United Arab Emirates            | 0.850                           | 1.000         | 1.012        | 0.000        | 0.012 |
| International pooled data       | 0.872                           | 0.999         | 0.996        | 0.036        | 0.010 |
| <b>ISCED level 3</b>            |                                 |               |              |              |       |
| Croatia                         | 0.856                           | 0.995         | 0.986        | 0.066        | 0.023 |
| Denmark                         | 0.883                           | 0.994         | 0.982        | 0.087        | 0.038 |
| Flemish Community (Belgium)     | 0.854                           | 0.988         | 0.963        | <b>0.113</b> | 0.050 |
| Portugal                        | 0.840                           | 1.000         | 1.011        | 0.000        | 0.013 |
| Saudi Arabia                    | 0.907                           | 1.000         | 1.005        | 0.000        | 0.017 |



| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| Slovenia                        | 0.876            | 1.000         | 1.002 | 0.000 | 0.036 |
| Türkiye                         | 0.927            | 1.000         | 1.003 | 0.000 | 0.009 |
| United Arab Emirates            | 0.853            | 0.999         | 0.998 | 0.023 | 0.024 |
| International pooled data       | 0.904            | 0.998         | 0.993 | 0.049 | 0.013 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.218. Measurement invariance results from MGCFA for scale T4PDELI with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.994     | 0.981 | 0.076 | 0.029 | -                       | -      | -       | -      |
| Equal loadings                | 0.990     | 0.988 | 0.061 | 0.048 | -0.004                  | 0.006  | -0.015  | 0.018  |
| Equal loadings and thresholds | 0.929     | 0.946 | 0.130 | 0.141 | -0.061                  | -0.042 | 0.069   | 0.093  |

Note: Albania, Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), Finland, Montenegro, the Netherlands, New Zealand, Norway, Shanghai (China), Sweden and Viet Nam are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.219. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PDELI**

| Item    | Slope | Threshold 1 | Threshold 2 |
|---------|-------|-------------|-------------|
| TC4G41A | 0.820 | -0.241      | 1.143       |
| TC4G41B | 0.880 | -0.801      | 0.518       |
| TC4G41D | 0.841 | -0.030      | 1.386       |
| TC4G41E | 0.789 | 0.294       | 1.353       |

Source: OECD, TALIS 2024 database.

### Diversity beliefs (T4PDIVBF)

The scale of *Diversity beliefs* (T4PDIVBF) was measured by three items (TC4G44B, TC4G44C and TC4G44D). For these items, principals had to indicate how many teachers would agree with different statements about diversity, using the following response categories: “None or almost none”, “Some”, “Many” and “Almost all or all”. Higher values on this scale indicate greater perceived diversity beliefs among teachers, as reported by principals. Table 11.220 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.221. The model fit indices for T4PDIVBF are not presented here as the scale was measured by just three items. As can be seen, scale reliabilities for T4PDIVBF are high, generally greater than 0.900, across all countries/territories.

Table 11.222 presents the results from the measurement invariance testing for T4PDIVBF for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit. The equal loadings

model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criteria for the CFI and TLI, close to the acceptable range for the RMSEA, but exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.223 presents the standardised item loadings and thresholds based on pooled data for the scale T4PDIVBF. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.220. Items and response categories used in the construction of scale T4PDIVBF**

| Scale or item | Question or item wording                                                                                 |
|---------------|----------------------------------------------------------------------------------------------------------|
| T4PDIVBF      | In your view, approximately how many teachers in this school would agree with the following statements?  |
|               | <i>Recoded response categories for scaling: 1=None, almost none or some; 2=Many; 3=All or almost all</i> |
|               | Scale mid-point: 2                                                                                       |
| TC4G44B       | It is important for students to learn that people from other cultures can have different values.         |
| TC4G44C       | Respecting other cultures is something that children and young people should learn as early as possible. |
| TC4G44D       | Children and young people should learn that people of different cultures have a lot in common.           |

Source: OECD, TALIS 2024 database.

**Table 11.221. Reliability coefficient alpha for single countries and pooled model for scale T4PDIVBF**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.925                           |
| Alberta (Canada)                | 0.962                           |
| Australia                       | 0.950                           |
| Austria                         | 0.905                           |
| Azerbaijan                      | 0.921                           |
| Bahrain                         | 0.943                           |
| Belgium                         | 0.925                           |
| Flemish Community (Belgium)     | 0.916                           |
| French Community (Belgium)      | 0.943                           |
| Brazil                          | 0.943                           |
| Bulgaria                        | 0.979                           |
| Chile                           | 0.975                           |
| Colombia                        | 0.946                           |
| Costa Rica                      | 0.955                           |
| Croatia                         | 0.970                           |
| Cyprus                          | 0.983                           |
| Czechia                         | 0.873                           |
| Denmark                         | 0.908                           |
| Estonia                         | 0.934                           |
| Finland                         | 0.953                           |
| France                          | 0.914                           |
| Hungary                         | 0.950                           |
| Iceland                         | 0.904                           |
| Israel                          | 0.959                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Italy                           | 0.956                           |
| Japan                           | 0.928                           |
| Kazakhstan                      | 0.832                           |
| Korea                           | 0.962                           |
| Kosovo                          | 0.934                           |
| Latvia                          | 0.925                           |
| Lithuania                       | 0.963                           |
| Malta                           | 0.906                           |
| Montenegro                      | 0.991                           |
| Morocco                         | 0.915                           |
| Netherlands                     | 0.947                           |
| New Zealand                     | 0.980                           |
| North Macedonia                 | 0.881                           |
| Norway                          | 0.940                           |
| Poland                          | 0.935                           |
| Portugal                        | 0.971                           |
| Romania                         | 0.957                           |
| Saudi Arabia                    | 0.938                           |
| Serbia                          | 0.971                           |
| Shanghai (China)                | 0.961                           |
| Singapore                       | 0.947                           |
| Slovak Republic                 | 0.942                           |
| Slovenia                        | 0.959                           |
| South Africa                    | 0.937                           |
| Spain                           | 0.979                           |
| Sweden                          | 0.946                           |
| Türkiye                         | 0.942                           |
| United Arab Emirates            | 0.952                           |
| United States                   | 0.986                           |
| Uzbekistan                      | 0.862                           |
| Viet Nam                        | 0.915                           |
| International pooled data       | 0.939                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.931                           |
| Belgium                         | 0.937                           |
| Flemish Community (Belgium)     | 0.932                           |
| French Community (Belgium)      | 0.946                           |
| Brazil                          | 0.973                           |
| France                          | 0.941                           |
| Japan                           | 0.957                           |
| Korea                           | 0.965                           |
| Morocco                         | 0.924                           |
| Netherlands                     | 0.911                           |
| New Zealand                     | 0.980                           |
| Saudi Arabia                    | 0.944                           |
| Slovenia                        | 0.969                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Spain                           | 0.971                           |
| Türkiye                         | 0.966                           |
| United Arab Emirates            | 0.937                           |
| International pooled data       | 0.949                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.989                           |
| Denmark                         | 0.936                           |
| Flemish Community (Belgium)     | 0.880                           |
| Portugal                        | 0.985                           |
| Saudi Arabia                    | 0.948                           |
| Slovenia                        | 0.906                           |
| Türkiye                         | 0.958                           |
| United Arab Emirates            | 0.968                           |
| International pooled data       | 0.950                           |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.222. Measurement invariance results from MGCFA for scale T4PDIVBF with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.999     | 0.998 | 0.078 | 0.017 | -0.001                  | -0.002 | 0.078   | 0.017  |
| Equal loadings and thresholds | 0.996     | 0.997 | 0.100 | 0.080 | -0.003                  | -0.001 | 0.021   | 0.063  |

Note: Alberta (Canada), Australia, the Flemish Community (Belgium), the French Community (Belgium), Iceland, Lithuania, the Netherlands, New Zealand, Norway and Singapore are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.223. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PDIVBF**

| Item    | Slope | Threshold 1 | Threshold 2 |
|---------|-------|-------------|-------------|
| TC4G44B | 0.858 | -1.373      | -0.236      |
| TC4G44C | 0.951 | -1.620      | -0.384      |
| TC4G44D | 0.930 | -1.641      | -0.344      |

Source: OECD, TALIS 2024 database.

### **Leadership in environmental and sustainability education (T4PLEADESE)**

The scale of *Leadership in environmental and sustainability education* (T4PDLEADESE) was measured by a set of four items (TC4G45A, TC4G45B, TC4G45C and TC4G45H), described in Table 11.224. Principals were asked to indicate their level of agreement with these items, which related to their role as principal in supporting education about environmental sustainability. All items were answered on a four-

point scale, with response categories of “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale indicate greater reported leadership in matters related to environmental and sustainability education.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.225. Scale reliabilities for T4PLEADESE are high (generally above 0.700) in most participating countries/territories, except for the ISCED level 2 population in New Zealand where it does not reach the cut-off criterion. In terms of model fit, the CFI for T4PLEADESE is within the acceptable cut-off for most populations, the only exceptions are the ISCED level 2 population in Denmark and the Slovak Republic. The TLI exceeds the cut-off value also for these two populations, as well as for the ISCED level 2 population in Belgium, Estonia, Finland, the Flemish Community of Belgium, Norway and Sweden, and the ISCED level 1 population in New Zealand. The RMSEA is acceptable across all ISCED level 2 participants but exceeds the cut-off criterion in the ISCED level 1 population in Australia, Belgium, France, Saudi Arabia and the United Arab Emirates and in the ISCED level 3 population in Croatia, Denmark and Portugal. The SRMR exceeds the cut-off criterion only in the ISCED level 3 population in Denmark. Based on the single CFA model fit results, the scale T4PDLEADESE works well across all populations except in Denmark (ISCED level 2) and in the Slovak Republic (ISCED level 2), where the CFI, TLI and RMSEA do not reach the acceptable criteria, as well as in New Zealand (ISCED level 1), where the TLI, RMSEA and SRMR do not reach the acceptable criteria.

Table 11.226 presents the results from the measurement invariance testing for T4PLEADESE for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and the equal loadings model is within the cut-off criteria for the RMSEA and SRMR, close for the TLI but exceeds the cut-off for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all indices. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.227 presents the standardised item loadings and thresholds based on pooled data for the scale T4PLEADESE. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.224. Items and response categories used in the construction of scale T4PLEADESE**

| Scale or item | Question or item wording                                                                                                                                                 |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4PLEADESE    | Thinking about your role as a principal in supporting education about environmental sustainability, how strongly do you agree or disagree with the following statements? |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree or disagree; 2=Agree; 3=Strongly agree</i>                                                               |
|               | Scale mid-point: 2                                                                                                                                                       |
| TC4G45A       | It is important for me as a principal to address environmental sustainability with the curriculum.                                                                       |
| TC4G45B       | I have the resources I need to develop a school strategy on including environmental sustainability in the curriculum.                                                    |
| TC4G45C       | I am confident supporting teachers so that they can teach about environmental sustainability.                                                                            |
| TC4G45H       | I encourage teachers to teach about climate change across different subjects.                                                                                            |

Source: OECD, TALIS 2024 database.

**Table 11.225. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4PLEADESE**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 2                   |                  |               |       |       |       |
| Albania                         | 0.850            | 0.995         | 0.986 | 0.060 | 0.029 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Alberta (Canada)                | 0.806                           | 1.000         | 1.020        | 0.000        | 0.026 |
| Australia                       | 0.818                           | 0.967         | 0.901        | <b>0.212</b> | 0.069 |
| Austria                         | 0.796                           | 1.000         | 1.002        | 0.000        | 0.027 |
| Azerbaijan                      | 0.845                           | 1.000         | 1.003        | 0.000        | 0.017 |
| Bahrain                         | 0.886                           | 0.989         | 0.967        | <b>0.154</b> | 0.034 |
| Belgium                         | 0.673                           | 0.922         | <b>0.767</b> | <b>0.151</b> | 0.057 |
| Flemish Community (Belgium)     | 0.639                           | 0.950         | <b>0.851</b> | <b>0.103</b> | 0.046 |
| French Community (Belgium)      | 0.732                           | 0.998         | 0.995        | 0.033        | 0.040 |
| Brazil                          | 0.824                           | 0.991         | 0.972        | 0.098        | 0.036 |
| Bulgaria                        | 0.834                           | 0.987         | 0.960        | <b>0.107</b> | 0.045 |
| Chile                           | 0.851                           | 0.997         | 0.992        | 0.054        | 0.020 |
| Colombia                        | 0.679                           | 1.000         | 1.009        | 0.000        | 0.021 |
| Costa Rica                      | 0.838                           | 1.000         | 1.004        | 0.000        | 0.026 |
| Croatia                         | 0.836                           | 1.000         | 1.002        | 0.000        | 0.015 |
| Cyprus                          | 0.857                           | 1.000         | 1.004        | 0.000        | 0.021 |
| Czechia                         | 0.851                           | 0.999         | 0.997        | 0.033        | 0.014 |
| Denmark                         | 0.659                           | <b>0.895</b>  | <b>0.686</b> | <b>0.227</b> | 0.087 |
| Estonia                         | 0.773                           | 0.956         | <b>0.867</b> | <b>0.150</b> | 0.045 |
| Finland                         | 0.800                           | 0.965         | <b>0.896</b> | <b>0.165</b> | 0.046 |
| France                          | 0.765                           | 1.000         | 1.008        | 0.000        | 0.024 |
| Hungary                         | 0.884                           | 0.995         | 0.984        | 0.090        | 0.027 |
| Iceland                         | 0.887                           | 1.000         | 1.002        | 0.000        | 0.021 |
| Israel                          | 0.909                           | 1.000         | 1.005        | 0.000        | 0.010 |
| Italy                           | 0.756                           | 0.986         | 0.958        | 0.082        | 0.035 |
| Japan                           | 0.823                           | 0.970         | 0.911        | <b>0.145</b> | 0.052 |
| Kazakhstan                      | 0.843                           | 0.997         | 0.991        | 0.044        | 0.021 |
| Korea                           | 0.901                           | 0.989         | 0.967        | <b>0.135</b> | 0.066 |
| Kosovo                          | 0.833                           | 0.989         | 0.967        | <b>0.106</b> | 0.036 |
| Latvia                          | 0.788                           | 0.999         | 0.996        | 0.027        | 0.023 |
| Lithuania                       | 0.767                           | 0.988         | 0.965        | 0.067        | 0.043 |
| Malta                           | 0.865                           | 0.992         | 0.976        | <b>0.130</b> | 0.026 |
| Montenegro                      | 0.921                           | 0.990         | 0.971        | <b>0.215</b> | 0.038 |
| Morocco                         | 0.778                           | 1.000         | 1.003        | 0.000        | 0.025 |
| Netherlands                     | 0.834                           | 1.000         | 1.025        | 0.000        | 0.022 |
| New Zealand                     | <b>0.520</b>                    | 1.000         | 1.014        | 0.000        | 0.047 |
| North Macedonia                 | 0.822                           | 1.000         | 1.019        | 0.000        | 0.007 |
| Norway                          | 0.761                           | 0.911         | <b>0.733</b> | <b>0.231</b> | 0.079 |
| Poland                          | 0.912                           | 0.999         | 0.998        | 0.036        | 0.020 |
| Portugal                        | 0.811                           | 0.991         | 0.973        | 0.089        | 0.031 |
| Romania                         | 0.870                           | 0.996         | 0.988        | 0.087        | 0.034 |
| Saudi Arabia                    | 0.842                           | 0.996         | 0.989        | 0.072        | 0.019 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |              |
|---------------------------------|---------------------------------|---------------|--------------|--------------|--------------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR         |
| Serbia                          | 0.896                           | 0.998         | 0.994        | 0.067        | 0.021        |
| Shanghai (China)                | 0.944                           | 0.999         | 0.996        | <b>0.108</b> | 0.030        |
| Singapore                       | 0.905                           | 0.997         | 0.992        | <b>0.120</b> | 0.046        |
| Slovak Republic                 | 0.754                           | <b>0.889</b>  | <b>0.668</b> | <b>0.249</b> | 0.078        |
| Slovenia                        | 0.830                           | 0.977         | 0.932        | <b>0.147</b> | 0.050        |
| South Africa                    | 0.851                           | 0.997         | 0.991        | 0.056        | 0.020        |
| Spain                           | 0.814                           | 0.995         | 0.985        | 0.052        | 0.034        |
| Sweden                          | 0.730                           | 0.908         | <b>0.724</b> | <b>0.163</b> | 0.051        |
| Türkiye                         | 0.829                           | 1.000         | 1.003        | 0.000        | 0.017        |
| United Arab Emirates            | 0.901                           | 0.995         | 0.984        | 0.095        | 0.021        |
| United States                   | 0.911                           | 0.995         | 0.984        | 0.092        | 0.027        |
| Uzbekistan                      | 0.854                           | 1.000         | 1.014        | 0.000        | 0.007        |
| Viet Nam                        | 0.881                           | 0.993         | 0.980        | <b>0.120</b> | 0.026        |
| International pooled data       | 0.851                           | 0.989         | 0.968        | 0.086        | 0.022        |
| <b>ISCED level 1</b>            |                                 |               |              |              |              |
| Australia                       | 0.830                           | 0.948         | <b>0.843</b> | <b>0.219</b> | 0.057        |
| Belgium                         | 0.720                           | 0.918         | <b>0.753</b> | <b>0.179</b> | 0.060        |
| Flemish Community (Belgium)     | 0.762                           | 0.983         | 0.948        | 0.097        | 0.041        |
| French Community (Belgium)      | 0.728                           | 0.970         | 0.911        | 0.097        | 0.043        |
| Brazil                          | 0.854                           | 0.994         | 0.983        | 0.090        | 0.033        |
| France                          | 0.820                           | 0.976         | 0.927        | <b>0.139</b> | 0.036        |
| Japan                           | 0.851                           | 1.000         | 1.008        | 0.000        | 0.014        |
| Korea                           | 0.884                           | 1.000         | 1.012        | 0.000        | 0.031        |
| Morocco                         | 0.801                           | 1.000         | 1.016        | 0.000        | 0.004        |
| Netherlands                     | 0.880                           | 0.989         | 0.966        | <b>0.272</b> | 0.079        |
| New Zealand                     | 0.826                           | 0.944         | <b>0.831</b> | <b>0.263</b> | <b>0.102</b> |
| Saudi Arabia                    | 0.784                           | 0.978         | 0.934        | <b>0.126</b> | 0.040        |
| Slovenia                        | 0.835                           | 0.999         | 0.997        | 0.036        | 0.024        |
| Spain                           | 0.864                           | 0.997         | 0.992        | 0.040        | 0.022        |
| Türkiye                         | 0.860                           | 0.999         | 0.996        | 0.036        | 0.020        |
| United Arab Emirates            | 0.912                           | 0.992         | 0.977        | <b>0.156</b> | 0.038        |
| International pooled data       | 0.867                           | 0.993         | 0.980        | 0.081        | 0.021        |
| <b>ISCED level 3</b>            |                                 |               |              |              |              |
| Croatia                         | 0.880                           | 0.990         | 0.969        | <b>0.103</b> | 0.034        |
| Denmark                         | 0.861                           | 0.972         | 0.916        | <b>0.290</b> | <b>0.148</b> |
| Flemish Community (Belgium)     | 0.721                           | 0.996         | 0.988        | 0.039        | 0.032        |
| Portugal                        | 0.871                           | 0.977         | 0.932        | <b>0.156</b> | 0.057        |
| Saudi Arabia                    | 0.800                           | 0.995         | 0.986        | 0.058        | 0.028        |
| Slovenia                        | 0.824                           | 1.000         | 1.023        | 0.000        | 0.010        |
| Türkiye                         | 0.824                           | 0.989         | 0.968        | 0.092        | 0.036        |
| United Arab Emirates            | 0.925                           | 0.998         | 0.994        | 0.072        | 0.021        |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| International pooled data       | 0.871                           | 0.980         | 0.939 | <b>0.142</b> | 0.039 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.226. Measurement invariance results from MGCFA for scale T4PLEADESE with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.991     | 0.972 | 0.098 | 0.033 | -                       | -      | -       | -      |
| Equal loadings                | 0.970     | 0.964 | 0.112 | 0.066 | -0.021                  | -0.009 | 0.014   | 0.033  |
| Equal loadings and thresholds | 0.907     | 0.929 | 0.156 | 0.186 | -0.064                  | -0.035 | 0.045   | 0.120  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), Hungary, Korea, Kosovo, the Netherlands, New Zealand, North Macedonia, Norway and Shanghai (China) are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.227. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PLEADESE**

| Item    | Slope | Threshold 1 | Threshold 2 |
|---------|-------|-------------|-------------|
| TC4G45A | 0.778 | -1.706      | 0.057       |
| TC4G45B | 0.714 | -0.393      | 0.963       |
| TC4G45C | 0.853 | -1.098      | 0.511       |
| TC4G45H | 0.733 | -1.203      | 0.363       |

Source: OECD, TALIS 2024 database.

### Instructional barriers to teaching climate change (T4PINBRCC)

The scale of *Instructional barriers to teaching climate change* (T4PINBRCC) was constructed using five items (TC4G46D, TC4G46F, TC4G46H, TC4G46I and TC4G46J). For each item, principals were asked to what extent they viewed it as a barrier to teaching about climate change in their school. Response options included: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher values on this scale indicate a greater perceived presence of instructional barriers to teaching climate change.

Table 11.229 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.229. As can be seen, scale reliabilities for T4PINBRCC are acceptable in all countries/territories. The scale T4PINBRCC has a generally good model fit across populations. The CFI is within the cut-off criterion for all participating countries/territories. The TLI is also within the cut-off for most participants, except for the ISCED level 2 population in Sweden and ISCED level 3 population in Portugal. The RMSEA exceeds the cut-off criterion in five ISCED level 2 participants, and three ISCED level 1 and ISCED level 3 participants, respectively. Of these, the RMSEA is particularly high in the ISCED level 2 population in Bahrain and Sweden, the ISCED level 1 population in New Zealand, and the ISCED level 3



population in Portugal. The SRMR is acceptable for most populations but exceeds the cut-off criterion in the ISCED level 2 population in the Netherlands and Malta, as well as in the ISCED level 1 population in New Zealand.

Table 11.230 presents the results from the measurement invariance testing for T4PINBRCC for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and the equal loadings model is within the cut-off criteria for the RMSEA and SRMR, and close to the acceptable range for the TLI and CFI. The degree of change between the equal loadings and the equal loadings exceeds the cut-offs for all indices. No special caution is required when comparing scale score results across countries/territories.

Table 11.231 presents the standardised item loadings and thresholds based on pooled data for the scale T4PINBRCC. Items ITC4G46D and TC4G46F show acceptable loadings, while items TC4G46H, TC4G46I and TC4G46J show high loadings. Results by participating country/territory show low loadings for item ITC4G46D in the ISCED level 2 population in Albania, Australia, Azerbaijan, Croatia, South Africa and Sweden; in the ISCED level 1 population in Belgium, Brazil, the French Community of Belgium and Spain; and in the ISCED level 3 population in Denmark and Portugal. Loadings for item TC4G46F are also low in the ISCED level 2 population in Bulgaria, Chile, Denmark, Israel, Latvia, Portugal, Romania, Singapore, Slovenia, South Africa and the United Arab Emirates; in the ISCED level 1 population in Australia, the Flemish Community of Belgium, France, Slovenia and Spain; and in the ISCED level 3 population in Denmark.

**Table 11.228. Items and response categories used in the construction of scale T4PINBRCC**

| Scale or item | Question or item wording                                                                                                    |
|---------------|-----------------------------------------------------------------------------------------------------------------------------|
| T4PINBRCC     | In your view, to what extent are the following barriers for teaching about climate change in this school?                   |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit or a lot</i>                      |
|               | Scale mid-point: 2                                                                                                          |
| TC4G46D       | Teachers don't have the materials needed to teach the subject.                                                              |
| TC4G46F       | Our <school governing board> and/or <local, municipality/regional, state, or national/federal> authority does not allow it. |
| TC4G46H       | The curriculum is not flexible enough.                                                                                      |
| TC4G46I       | The curriculum does not mandate it be taught.                                                                               |
| TC4G46J       | Assessments do not include it.                                                                                              |

Source: OECD, TALIS 2024 database.

**Table 11.229. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4PINBRCC**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.829            | 0.983         | 0.965 | 0.082        | 0.041 |
| Alberta (Canada)                | 0.867            | 0.990         | 0.979 | 0.096        | 0.061 |
| Australia                       | 0.824            | 0.981         | 0.962 | <b>0.104</b> | 0.072 |
| Austria                         | 0.727            | 1.000         | 1.016 | 0.000        | 0.050 |
| Azerbaijan                      | 0.796            | 0.984         | 0.968 | 0.058        | 0.045 |
| Bahrain                         | 0.869            | 0.977         | 0.954 | <b>0.152</b> | 0.067 |
| Belgium                         | 0.819            | 0.999         | 0.997 | 0.023        | 0.038 |
| Flemish Community (Belgium)     | 0.834            | 1.000         | 1.009 | 0.000        | 0.036 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |              |
|---------------------------------|---------------------------------|---------------|-------|--------------|--------------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR         |
| French Community (Belgium)      | 0.779                           | 1.000         | 1.007 | 0.000        | 0.049        |
| Brazil                          | 0.886                           | 1.000         | 1.002 | 0.000        | 0.030        |
| Bulgaria                        | 0.770                           | 0.998         | 0.995 | 0.032        | 0.074        |
| Chile                           | 0.796                           | 0.987         | 0.973 | 0.059        | 0.046        |
| Colombia                        | 0.910                           | 0.996         | 0.992 | 0.062        | 0.034        |
| Costa Rica                      | 0.842                           | 1.000         | 1.009 | 0.000        | 0.034        |
| Croatia                         | 0.791                           | 1.000         | 1.004 | 0.000        | 0.043        |
| Cyprus                          | 0.837                           | 0.998         | 0.996 | 0.041        | 0.053        |
| Czechia                         | 0.781                           | 0.988         | 0.977 | 0.043        | 0.069        |
| Denmark                         | 0.808                           | 1.000         | 1.002 | 0.000        | 0.045        |
| Estonia                         | 0.839                           | 0.995         | 0.991 | 0.055        | 0.054        |
| Finland                         | 0.862                           | 1.000         | 1.015 | 0.000        | 0.031        |
| France                          | 0.805                           | 0.991         | 0.982 | 0.066        | 0.054        |
| Hungary                         | 0.852                           | 0.992         | 0.985 | 0.063        | 0.082        |
| Iceland                         | 0.718                           | 0.961         | 0.922 | <b>0.103</b> | 0.073        |
| Israel                          | 0.793                           | 1.000         | 1.027 | 0.000        | 0.032        |
| Italy                           | 0.840                           | 0.984         | 0.968 | 0.091        | 0.055        |
| Japan                           | 0.871                           | 0.997         | 0.995 | 0.059        | 0.033        |
| Kazakhstan                      | 0.853                           | 0.981         | 0.963 | 0.065        | 0.040        |
| Korea                           | 0.921                           | 0.994         | 0.987 | 0.065        | 0.039        |
| Kosovo                          | 0.826                           | 0.993         | 0.986 | 0.051        | 0.036        |
| Latvia                          | 0.815                           | 0.992         | 0.984 | 0.053        | 0.041        |
| Lithuania                       | 0.858                           | 1.000         | 1.003 | 0.000        | 0.040        |
| Malta                           | 0.856                           | 1.000         | 1.013 | 0.000        | <b>0.172</b> |
| Montenegro                      | 0.841                           | 0.984         | 0.967 | <b>0.109</b> | 0.050        |
| Morocco                         | 0.801                           | 0.996         | 0.992 | 0.022        | 0.036        |
| Netherlands                     | 0.838                           | 0.995         | 0.990 | 0.050        | <b>0.189</b> |
| New Zealand                     | 0.910                           |               |       |              |              |
| North Macedonia                 | 0.835                           | 1.000         | 1.012 | 0.000        | 0.015        |
| Norway                          | 0.848                           | 0.995         | 0.990 | 0.054        | 0.053        |
| Poland                          | 0.791                           | 0.995         | 0.989 | 0.041        | 0.053        |
| Portugal                        | 0.813                           | 0.996         | 0.993 | 0.043        | 0.038        |
| Romania                         | 0.814                           | 0.999         | 0.998 | 0.042        | 0.031        |
| Saudi Arabia                    | 0.882                           | 0.995         | 0.990 | 0.076        | 0.037        |
| Serbia                          | 0.834                           | 0.995         | 0.991 | 0.058        | 0.048        |
| Shanghai (China)                | 0.906                           | 0.996         | 0.993 | 0.072        | 0.041        |
| Singapore                       | 0.874                           | 0.997         | 0.994 | 0.055        | 0.100        |
| Slovak Republic                 | 0.763                           | 0.990         | 0.980 | 0.047        | 0.035        |
| Slovenia                        | 0.807                           | 1.000         | 1.010 | 0.000        | 0.019        |
| South Africa                    | 0.775                           | 1.000         | 1.001 | 0.000        | 0.026        |
| Spain                           | 0.847                           | 0.968         | 0.937 | 0.080        | 0.045        |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |              |
|---------------------------------|---------------------------------|---------------|--------------|--------------|--------------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR         |
| Sweden                          | 0.764                           | 0.942         | <b>0.883</b> | <b>0.136</b> | 0.091        |
| Türkiye                         | 0.888                           | 0.994         | 0.988        | 0.064        | 0.039        |
| United Arab Emirates            | 0.777                           | 1.000         | 1.009        | 0.000        | 0.050        |
| United States                   | 0.795                           | 1.000         | 1.006        | 0.000        | 0.032        |
| Uzbekistan                      | 0.847                           | 0.986         | 0.972        | 0.074        | 0.039        |
| Viet Nam                        | 0.897                           | 0.995         | 0.990        | 0.057        | 0.032        |
| International pooled data       | 0.839                           | 0.995         | 0.990        | 0.043        | 0.023        |
| <b>ISCED level 1</b>            |                                 |               |              |              |              |
| Australia                       | 0.773                           | 0.981         | 0.962        | <b>0.111</b> | 0.081        |
| Belgium                         | 0.757                           | 0.978         | 0.956        | 0.087        | 0.061        |
| Flemish Community (Belgium)     | 0.779                           | 0.980         | 0.960        | 0.087        | 0.060        |
| French Community (Belgium)      | 0.773                           | 0.999         | 0.998        | 0.017        | 0.037        |
| Brazil                          | 0.864                           | 0.999         | 0.999        | 0.020        | 0.026        |
| France                          | 0.719                           | 0.960         | 0.920        | 0.080        | 0.050        |
| Japan                           | 0.846                           | 1.000         | 1.009        | 0.000        | 0.035        |
| Korea                           | 0.958                           | 0.998         | 0.996        | 0.067        | 0.024        |
| Morocco                         | 0.812                           | 0.979         | 0.957        | 0.081        | 0.052        |
| Netherlands                     | 0.781                           | 0.999         | 0.998        | 0.019        | 0.052        |
| New Zealand                     | 0.722                           | 0.965         | 0.930        | <b>0.130</b> | <b>0.115</b> |
| Saudi Arabia                    | 0.858                           | 0.978         | 0.956        | <b>0.110</b> | 0.045        |
| Slovenia                        | 0.818                           | 1.000         | 1.007        | 0.000        | 0.022        |
| Spain                           | 0.740                           | 1.000         | 1.012        | 0.000        | 0.022        |
| Türkiye                         | 0.840                           | 0.994         | 0.988        | 0.052        | 0.036        |
| United Arab Emirates            | 0.870                           | 0.991         | 0.981        | 0.082        | 0.051        |
| International pooled data       | 0.826                           | 0.991         | 0.983        | 0.058        | 0.025        |
| <b>ISCED level 3</b>            |                                 |               |              |              |              |
| Croatia                         | 0.877                           | 0.983         | 0.966        | <b>0.111</b> | 0.035        |
| Denmark                         | 0.771                           | 0.996         | 0.993        | 0.060        | 0.065        |
| Flemish Community (Belgium)     | 0.813                           | 0.985         | 0.970        | 0.068        | 0.056        |
| Portugal                        | 0.781                           | 0.929         | <b>0.858</b> | <b>0.175</b> | 0.095        |
| Saudi Arabia                    | 0.862                           | 0.994         | 0.989        | 0.068        | 0.034        |
| Slovenia                        | 0.798                           | 1.000         | 1.010        | 0.000        | 0.046        |
| Türkiye                         | 0.878                           | 0.990         | 0.980        | <b>0.109</b> | 0.060        |
| United Arab Emirates            | 0.915                           | 0.998         | 0.995        | 0.041        | 0.050        |
| International pooled data       | 0.843                           | 0.990         | 0.980        | 0.076        | 0.044        |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.230. Measurement invariance results from MGCFA for scale T4PINBRCC with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.995     | 0.990 | 0.050 | 0.043 | -                       | -      | -       | -      |
| Equal loadings                | 0.982     | 0.980 | 0.072 | 0.075 | -0.013                  | -0.010 | 0.022   | 0.032  |
| Equal loadings and thresholds | 0.949     | 0.960 | 0.101 | 0.137 | -0.033                  | -0.020 | 0.029   | 0.062  |

Note: Alberta (Canada), Austria, Bulgaria, Denmark, Finland, the Flemish Community (Belgium), the French Community (Belgium), Malta, the Netherlands, New Zealand, Norway and Singapore are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.231. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PINBRCC**

| Item    | Slope | Threshold 1 | Threshold 2 |
|---------|-------|-------------|-------------|
| TC4G46D | 0.555 | -0.635      | 0.556       |
| TC4G46F | 0.571 | 1.110       | 1.667       |
| TC4G46H | 0.787 | -0.275      | 0.809       |
| TC4G46I | 0.905 | -0.100      | 0.833       |
| TC4G46J | 0.783 | -0.336      | 0.664       |

Source: OECD, TALIS 2024 database.

### **Attitudinal barriers to teaching climate change (T4PATBRCC)**

The scale of *Attitudinal barriers to teaching climate change* (T4PATBRCC) was constructed using five items (TC4G46A, TC4G46B, TC4G46C, TC4G46E and TC4G46G) also related to principals' views on barriers for teachers to teach about climate change. Response options included: "Not at all", "To some extent", "Quite a bit" and "A lot". Higher values on this scale indicate a greater perceived presence of attitudinal barriers to teaching climate change. Table 11.232 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.233. Scale reliabilities for T4PATBRCC are generally high, above 0.700, across populations. However, the reliability does not reach the cut-off criterion in the ISCED level 2 population in Alberta (Canada) and the Netherlands, and in the ISCED level 3 population in the Flemish Community of Belgium. As can be observed from Table 11.233, the CFI is within the cut-off criterion for almost all participating countries/territories; except for the ISCED level 2 population in France. The TLI is generally acceptable but exceeds the cut-off in four ISCED level 2 participants (France, Iceland, Montenegro and the United States), in the ISCED level 1 population in Slovenia, and in the ISCED level 3 population in the Flemish Community of Belgium. The RMSEA exceeds the cut-off criterion in nine ISCED level 2 participants (particularly in France, Malta and Montenegro), three ISCED level 1 participants (Belgium, the Flemish Community of Belgium and Slovenia), and in the ISCED level 3 population in Türkiye. The SRMR is within the cut-off for most populations, except the ISCED level 2 population in France and the United States. Based on the single CFA model fit results, the scale T4PATBRCC works well across all populations except in France (ISCED level 2), where none of the fit indices reach the acceptable criteria, and in the United States (ISCED level 2), where the TLI, RMSEA and SRMR do not reach the acceptable criteria.

Table 11.234 presents the results from the measurement invariance testing for T4PATBRCC for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and the equal loadings model is within the cut-off criteria for the RMSEA and SRMR, and close to the acceptable range for the TLI and CFI. The degree of change between the equal loadings and the

equal loadings and thresholds models exceeds the cut-off criteria for all indices. No special caution is required when comparing scale score results across countries/territories.

Table 11.235 presents the standardised item loadings and thresholds based on pooled data for the scale T4PATBRCC. Item TC4G46G shows a lower, but still acceptable, loading. All remaining items show high loadings based on the pooled data. Results by participating country/territory show low loadings for items TC4G46C in Israel (ISCED level 2), TC4G46E in Singapore (ISCED level 2) and TC4G46G in the ISCED level 2 population in Albania, Austria, Azerbaijan, Croatia, Czechia, France, Hungary, Israel, Kazakhstan, Romania, Serbia and in the United Arab Emirates; in the ISCED level 1 population in Belgium, the Flemish Community of Belgium, France, the French Community of Belgium, Morocco and the United Arab Emirates; and in the ISCED level 3 population in the United Arab Emirates.

**Table 11.232. Items and response categories used in the construction of scale T4PATBRCC**

| Scale or item | Question or item wording                                                                                  |
|---------------|-----------------------------------------------------------------------------------------------------------|
| T4PATBRCC     | In your view, to what extent are the following barriers for teaching about climate change in this school? |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit or a lot</i>    |
|               | Scale mid-point: 2                                                                                        |
| TC4G46A       | Teachers think it is not related to the subject(s) they teach.                                            |
| TC4G46B       | Teachers think students are too young.                                                                    |
| TC4G46C       | Teachers don't know enough about it.                                                                      |
| TC4G46E       | Teachers don't believe in it.                                                                             |
| TC4G46G       | Teachers think students have already learned about it in school.                                          |

Source: OECD, TALIS 2024 database.

**Table 11.233. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4PATBRCC**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.796            | 0.993         | 0.985 | 0.044        | 0.030 |
| Alberta (Canada)                | 0.692            | 1.000         | 1.105 | 0.000        | 0.043 |
| Australia                       | 0.799            | 0.995         | 0.991 | 0.028        | 0.056 |
| Austria                         | 0.742            | 1.000         | 1.000 | 0.004        | 0.031 |
| Azerbaijan                      | 0.706            | 0.957         | 0.914 | 0.090        | 0.056 |
| Bahrain                         | 0.893            | 0.991         | 0.982 | 0.094        | 0.035 |
| Belgium                         | 0.808            | 0.971         | 0.941 | 0.080        | 0.049 |
| Flemish Community (Belgium)     | 0.811            | 0.956         | 0.911 | <b>0.110</b> | 0.060 |
| French Community (Belgium)      | 0.751            | 1.000         | 1.063 | 0.000        | 0.032 |
| Brazil                          | 0.872            | 0.997         | 0.993 | 0.040        | 0.027 |
| Bulgaria                        | 0.839            | 0.994         | 0.988 | 0.050        | 0.047 |
| Chile                           | 0.877            | 0.976         | 0.951 | 0.092        | 0.057 |
| Colombia                        | 0.924            | 1.000         | 1.002 | 0.000        | 0.018 |
| Costa Rica                      | 0.884            | 0.978         | 0.957 | <b>0.103</b> | 0.046 |
| Croatia                         | 0.820            | 0.976         | 0.953 | 0.089        | 0.048 |
| Cyprus                          | 0.838            | 0.992         | 0.984 | 0.072        | 0.044 |
| Czechia                         | 0.749            | 1.000         | 1.003 | 0.000        | 0.024 |
| Denmark                         | 0.750            | 1.000         | 1.080 | 0.000        | 0.021 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |              |
|---------------------------------|---------------------------------|---------------|--------------|--------------|--------------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR         |
| Estonia                         | 0.859                           | 0.996         | 0.992        | 0.042        | 0.028        |
| Finland                         | 0.834                           | 0.972         | 0.944        | 0.083        | 0.059        |
| France                          | 0.807                           | <b>0.870</b>  | <b>0.740</b> | <b>0.202</b> | <b>0.104</b> |
| Hungary                         | 0.829                           | 0.998         | 0.997        | 0.029        | 0.034        |
| Iceland                         | 0.700                           | 0.912         | <b>0.824</b> | <b>0.134</b> | 0.078        |
| Israel                          | 0.750                           | 0.976         | 0.952        | 0.059        | 0.052        |
| Italy                           | 0.906                           | 1.000         | 0.999        | 0.020        | 0.024        |
| Japan                           | 0.832                           | 0.998         | 0.996        | 0.027        | 0.034        |
| Kazakhstan                      | 0.811                           | 1.000         | 1.009        | 0.000        | 0.022        |
| Korea                           | 0.932                           | 0.995         | 0.991        | 0.080        | 0.031        |
| Kosovo                          | 0.816                           | 0.987         | 0.973        | 0.070        | 0.038        |
| Latvia                          | 0.783                           | 1.000         | 1.012        | 0.000        | 0.032        |
| Lithuania                       | 0.884                           | 1.000         | 1.005        | 0.000        | 0.018        |
| Malta                           | 0.863                           | 0.962         | 0.924        | <b>0.172</b> | 0.099        |
| Montenegro                      | 0.838                           | 0.948         | <b>0.895</b> | <b>0.173</b> | 0.066        |
| Morocco                         | 0.852                           | 1.000         | 1.001        | 0.000        | 0.030        |
| Netherlands                     | 0.696                           | 0.982         | 0.965        | 0.044        | 0.082        |
| New Zealand                     | 0.754                           | 1.000         | 1.016        | 0.000        | 0.080        |
| North Macedonia                 | 0.821                           | 0.992         | 0.984        | 0.059        | 0.031        |
| Norway                          | 0.860                           | 0.974         | 0.948        | <b>0.112</b> | 0.091        |
| Poland                          | 0.813                           | 1.000         | 1.020        | 0.000        | 0.019        |
| Portugal                        | 0.816                           | 0.994         | 0.988        | 0.039        | 0.042        |
| Romania                         | 0.833                           | 0.994         | 0.987        | 0.051        | 0.035        |
| Saudi Arabia                    | 0.871                           | 0.995         | 0.990        | 0.053        | 0.024        |
| Serbia                          | 0.803                           | 0.978         | 0.956        | 0.087        | 0.051        |
| Shanghai (China)                | 0.880                           | 0.997         | 0.994        | 0.068        | 0.034        |
| Singapore                       | 0.820                           | 0.998         | 0.996        | 0.023        | 0.042        |
| Slovak Republic                 | 0.817                           | 0.957         | 0.914        | <b>0.118</b> | 0.060        |
| Slovenia                        | 0.833                           | 0.985         | 0.970        | 0.080        | 0.043        |
| South Africa                    | 0.795                           | 0.968         | 0.936        | 0.085        | 0.047        |
| Spain                           | 0.865                           | 0.996         | 0.992        | 0.027        | 0.037        |
| Sweden                          | 0.771                           | 0.999         | 0.998        | 0.011        | 0.061        |
| Türkiye                         | 0.861                           | 1.000         | 1.009        | 0.000        | 0.016        |
| United Arab Emirates            | 0.864                           | 0.997         | 0.994        | 0.039        | 0.031        |
| United States                   | 0.712                           | 0.931         | <b>0.861</b> | <b>0.102</b> | <b>0.107</b> |
| Uzbekistan                      | 0.849                           | 0.988         | 0.977        | 0.070        | 0.039        |
| Viet Nam                        | 0.874                           | 1.000         | 1.002        | 0.000        | 0.020        |
| International pooled data       | 0.827                           | 0.987         | 0.974        | 0.057        | 0.026        |
| <b>ISCED level 1</b>            |                                 |               |              |              |              |
| Australia                       | 0.794                           | 0.985         | 0.971        | 0.060        | 0.047        |
| Belgium                         | 0.761                           | 0.956         | 0.913        | <b>0.119</b> | 0.065        |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Flemish Community (Belgium)     | 0.751                           | 0.954         | 0.909        | <b>0.152</b> | 0.074 |
| French Community (Belgium)      | 0.769                           | 0.983         | 0.965        | 0.064        | 0.052 |
| Brazil                          | 0.887                           | 0.992         | 0.983        | 0.074        | 0.031 |
| France                          | 0.740                           | 1.000         | 1.011        | 0.000        | 0.028 |
| Japan                           | 0.837                           | 0.977         | 0.953        | 0.086        | 0.054 |
| Korea                           | 0.970                           | 0.998         | 0.997        | 0.097        | 0.030 |
| Morocco                         | 0.853                           | 0.994         | 0.988        | 0.052        | 0.028 |
| Netherlands                     | 0.752                           | 1.000         | 1.014        | 0.000        | 0.044 |
| New Zealand                     | 0.778                           | 0.979         | 0.958        | 0.054        | 0.055 |
| Saudi Arabia                    | 0.862                           | 0.998         | 0.996        | 0.035        | 0.022 |
| Slovenia                        | 0.831                           | 0.944         | <b>0.888</b> | <b>0.145</b> | 0.064 |
| Spain                           | 0.910                           | 1.000         | 1.003        | 0.000        | 0.016 |
| Türkiye                         | 0.843                           | 0.994         | 0.989        | 0.045        | 0.026 |
| United Arab Emirates            | 0.852                           | 1.000         | 1.004        | 0.000        | 0.022 |
| International pooled data       | 0.852                           | 0.991         | 0.981        | 0.064        | 0.024 |
| <b>ISCED level 3</b>            |                                 |               |              |              |       |
| Croatia                         | 0.854                           | 0.994         | 0.988        | 0.051        | 0.045 |
| Denmark                         | 0.763                           | 0.974         | 0.948        | 0.054        | 0.062 |
| Flemish Community (Belgium)     | 0.674                           | 0.933         | <b>0.866</b> | 0.081        | 0.060 |
| Portugal                        | 0.811                           | 0.994         | 0.988        | 0.038        | 0.038 |
| Saudi Arabia                    | 0.849                           | 1.000         | 1.010        | 0.000        | 0.019 |
| Slovenia                        | 0.812                           | 0.978         | 0.957        | 0.080        | 0.066 |
| Türkiye                         | 0.899                           | 0.976         | 0.952        | <b>0.134</b> | 0.049 |
| United Arab Emirates            | 0.846                           | 0.999         | 0.998        | 0.023        | 0.046 |
| International pooled data       | 0.827                           | 0.996         | 0.991        | 0.035        | 0.023 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.234. Measurement invariance results from MGCFA for scale T4PATBRCC with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.991     | 0.983 | 0.059 | 0.038 | -                       | -      | -       | -      |
| Equal loadings                | 0.979     | 0.976 | 0.069 | 0.063 | -0.012                  | -0.006 | 0.010   | 0.026  |
| Equal loadings and thresholds | 0.916     | 0.935 | 0.115 | 0.138 | -0.062                  | -0.042 | 0.046   | 0.074  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand, Norway and Sweden are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.235. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PATBRCC**

| Item    | Slope | Threshold 1 | Threshold 2 |
|---------|-------|-------------|-------------|
| TC4G46A | 0.785 | -0.496      | 0.706       |
| TC4G46B | 0.785 | 0.268       | 1.273       |
| TC4G46C | 0.714 | -0.514      | 0.770       |
| TC4G46E | 0.770 | 0.381       | 1.373       |
| TC4G46G | 0.493 | -0.056      | 1.092       |

Source: OECD, TALIS 2024 database.

### Workplace well-being and stress (principal) (T4PWELS)

The principal scale of *Workplace well-being and stress* (T4PWELS) was measured using a set of four items (TC4G50A, TC4G50B, TC4G50C and TC4G50D). These items assessed the extent to which different situations related to well-being and stress occur. For each item, principals selected one of the following response options: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Item TC4G50B was reverse coded, as it was the only positive statement about well-being, ensuring that higher scores consistently reflected higher levels of stress or lower well-being. Higher scores in this scale reflect lower perceived well-being (and greater perceived stress) among principals. Table 11.236 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.237. Scale reliabilities for T4PWELS are acceptable in most participating countries/territories, except for the ISCED level 2 population in Viet Nam and Uzbekistan. As can be observed from Table 11.237, the CFI, TLI and SRMR for T4PWELS are within the acceptable cut-off criteria across all participating countries/territories. The RMSEA exceeds the cut-off criterion in 12 of the ISCED level 2 participants, particularly in Alberta (Canada), Australia, Austria, the French Community of Belgium, Korea and North Macedonia; and in 7 ISCED level 1 participants, particularly in Belgium, the Flemish Community of Belgium, New Zealand and Saudi Arabia. In all of these populations, the RMSEA is above 0.160. RMSEA also exceeds the cut-off criterion in the ISCED level 3 population in Denmark and Portugal, with values of 0.123 and 0.116, respectively.

Table 11.238 presents the results from the measurement invariance testing for T4PWELS for the ISCED level 2 population. The baseline model shows an acceptable model fit. The degree of change between the baseline and the equal loadings model is within the cut-off criteria for the RMSEA and SRMR, and close to the acceptable range for the TLI and CFI. The degree of change between the equal loadings and the equal loadings exceeds the cut-offs for all indices, although it is close to the acceptable range for the TLI and RMSEA. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

Table 11.239 presents the standardised item loadings and thresholds based on pooled data for the scale T4PWELS. All items, except TC4G50B, show acceptable loadings. Item TC4G50B has a low loading in the pooled model and in 25 of the ISCED level 2 participating countries/territories, in 10 ISCED level 1 participating countries/territories and in the ISCED level 3 population in Croatia, Portugal, Türkiye and the United Arab Emirates.

**Table 11.236. Items and response categories used in the construction of scale T4PWELS**

| Scale or item | Question or item wording                                                                        |
|---------------|-------------------------------------------------------------------------------------------------|
| T4PWELS       | In your experience as a principal at this school, to what extent do the following occur?        |
|               | Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot |
|               | Scale mid-point: 2.5                                                                            |



| Scale or item | Question or item wording                      |
|---------------|-----------------------------------------------|
| TC4G50A       | I experience stress in my work.               |
| TC4G50B*      | My job leaves me time for my personal life.   |
| TC4G50C       | My job negatively impacts my mental health.   |
| TC4G50D       | My job negatively impacts my physical health. |

Note: \* Item was reverse coded.

Source: OECD, TALIS 2024 database.

**Table 11.237. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4PWELS**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 2                   |                  |               |       |              |       |
| Albania                         | 0.740            | 1.000         | 1.013 | 0.000        | 0.011 |
| Alberta (Canada)                | 0.834            | 0.996         | 0.989 | <b>0.168</b> | 0.033 |
| Australia                       | 0.801            | 0.980         | 0.941 | <b>0.188</b> | 0.048 |
| Austria                         | 0.868            | 0.984         | 0.952 | <b>0.176</b> | 0.035 |
| Azerbaijan                      | 0.847            | 1.000         | 1.003 | 0.000        | 0.017 |
| Bahrain                         | 0.771            | 0.999         | 0.998 | 0.045        | 0.019 |
| Belgium                         | 0.807            | 0.999         | 0.998 | 0.040        | 0.017 |
| Flemish Community (Belgium)     | 0.835            | 1.000         | 1.009 | 0.000        | 0.012 |
| French Community (Belgium)      | 0.789            | 0.990         | 0.971 | <b>0.189</b> | 0.041 |
| Brazil                          | 0.717            | 0.995         | 0.986 | 0.094        | 0.025 |
| Bulgaria                        | 0.810            | 0.992         | 0.975 | <b>0.131</b> | 0.037 |
| Chile                           | 0.847            | 0.999         | 0.997 | 0.062        | 0.014 |
| Colombia                        | 0.774            | 1.000         | 1.000 | 0.000        | 0.020 |
| Costa Rica                      | 0.875            | 0.998         | 0.995 | 0.074        | 0.018 |
| Croatia                         | 0.832            | 1.000         | 0.999 | 0.035        | 0.017 |
| Cyprus                          | 0.720            | 1.000         | 1.015 | 0.000        | 0.015 |
| Czechia                         | 0.764            | 0.996         | 0.987 | 0.072        | 0.016 |
| Denmark                         | 0.895            | 0.999         | 0.997 | 0.062        | 0.014 |
| Estonia                         | 0.832            | 0.997         | 0.991 | 0.075        | 0.022 |
| Finland                         | 0.860            | 0.994         | 0.983 | 0.088        | 0.027 |
| France                          | 0.787            | 0.999         | 0.998 | 0.040        | 0.018 |
| Hungary                         | 0.810            | 1.000         | 1.007 | 0.000        | 0.005 |
| Iceland                         | 0.816            | 1.000         | 1.003 | 0.000        | 0.004 |
| Israel                          | 0.832            | 0.997         | 0.992 | 0.076        | 0.030 |
| Italy                           | 0.849            | 0.998         | 0.995 | 0.096        | 0.017 |
| Japan                           | 0.872            | 1.000         | 1.002 | 0.000        | 0.004 |
| Kazakhstan                      | 0.703            | 0.993         | 0.980 | 0.075        | 0.027 |
| Korea                           | 0.737            | 0.996         | 0.988 | <b>0.192</b> | 0.036 |
| Kosovo                          | 0.878            | 0.999         | 0.997 | 0.047        | 0.013 |
| Latvia                          | 0.764            | 0.991         | 0.973 | 0.078        | 0.024 |
| Lithuania                       | 0.886            | 0.997         | 0.991 | <b>0.144</b> | 0.023 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Malta                           | 0.870                           | 1.000         | 1.006        | 0.000        | 0.027 |
| Montenegro                      | 0.774                           | 1.000         | 1.008        | 0.000        | 0.006 |
| Morocco                         | 0.834                           | 0.997         | 0.991        | 0.047        | 0.017 |
| Netherlands                     | 0.897                           | 1.000         | 1.004        | 0.000        | 0.014 |
| New Zealand                     | 0.910                           | 0.992         | 0.976        | <b>0.121</b> | 0.023 |
| North Macedonia                 | 0.849                           | 0.989         | 0.967        | <b>0.169</b> | 0.026 |
| Norway                          | 0.839                           | 1.000         | 1.008        | 0.000        | 0.011 |
| Poland                          | 0.798                           | 0.999         | 0.996        | 0.043        | 0.014 |
| Portugal                        | 0.802                           | 1.000         | 1.003        | 0.000        | 0.009 |
| Romania                         | 0.870                           | 0.997         | 0.991        | 0.094        | 0.016 |
| Saudi Arabia                    | 0.863                           | 1.000         | 1.000        | 0.000        | 0.006 |
| Serbia                          | 0.804                           | 1.000         | 1.002        | 0.000        | 0.008 |
| Shanghai (China)                | 0.793                           | 0.994         | 0.982        | 0.077        | 0.024 |
| Singapore                       | 0.799                           | 1.000         | 1.011        | 0.000        | 0.003 |
| Slovak Republic                 | 0.743                           | 0.999         | 0.996        | 0.053        | 0.014 |
| Slovenia                        | 0.849                           | 1.000         | 1.002        | 0.000        | 0.011 |
| South Africa                    | 0.752                           | 0.996         | 0.988        | <b>0.111</b> | 0.024 |
| Spain                           | 0.836                           | 0.994         | 0.982        | 0.087        | 0.019 |
| Sweden                          | 0.851                           | 0.986         | 0.958        | <b>0.160</b> | 0.031 |
| Türkiye                         | 0.702                           | 1.000         | 1.002        | 0.000        | 0.008 |
| United Arab Emirates            | 0.785                           | 1.000         | 0.999        | 0.036        | 0.017 |
| United States                   | 0.934                           | 1.000         | 1.000        | 0.000        | 0.015 |
| Uzbekistan                      | 0.628                           | 1.000         | 1.009        | 0.000        | 0.003 |
| Viet Nam                        | <b>0.595</b>                    | 0.979         | 0.937        | <b>0.144</b> | 0.040 |
| International pooled data       | 0.813                           | 0.999         | 0.998        | 0.034        | 0.008 |
| ISCED level 1                   |                                 |               |              |              |       |
| Australia                       | 0.807                           | 0.994         | 0.981        | <b>0.125</b> | 0.041 |
| Belgium                         | 0.801                           | 0.983         | 0.950        | <b>0.195</b> | 0.037 |
| Flemish Community (Belgium)     | 0.849                           | 0.966         | <b>0.899</b> | <b>0.307</b> | 0.043 |
| French Community (Belgium)      | 0.743                           | 0.998         | 0.993        | 0.071        | 0.023 |
| Brazil                          | 0.775                           | 1.000         | 1.003        | 0.000        | 0.004 |
| France                          | 0.851                           | 1.000         | 1.002        | 0.000        | 0.004 |
| Japan                           | 0.855                           | 0.998         | 0.993        | <b>0.112</b> | 0.023 |
| Korea                           | 0.747                           | 0.999         | 0.998        | 0.092        | 0.021 |
| Morocco                         | 0.848                           | 0.999         | 0.996        | 0.045        | 0.014 |
| Netherlands                     | 0.869                           | 0.998         | 0.993        | 0.080        | 0.017 |
| New Zealand                     | 0.866                           | 0.983         | 0.950        | <b>0.197</b> | 0.040 |
| Saudi Arabia                    | 0.828                           | 0.998         | 0.993        | <b>0.173</b> | 0.037 |
| Slovenia                        | 0.863                           | 1.000         | 1.002        | 0.000        | 0.010 |
| Spain                           | 0.834                           | 1.000         | 1.001        | 0.000        | 0.008 |
| Türkiye                         | 0.764                           | 0.994         | 0.981        | <b>0.110</b> | 0.021 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| United Arab Emirates            | 0.807                           | 1.000         | 1.002 | 0.000        | 0.007 |
| International pooled data       | 0.830                           | 0.998         | 0.995 | 0.067        | 0.013 |
| <b>ISCED level 3</b>            |                                 |               |       |              |       |
| Croatia                         | 0.790                           | 0.998         | 0.994 | 0.067        | 0.017 |
| Denmark                         | 0.882                           | 0.994         | 0.982 | <b>0.123</b> | 0.029 |
| Flemish Community (Belgium)     | 0.829                           | 0.998         | 0.993 | 0.077        | 0.020 |
| Portugal                        | 0.834                           | 0.996         | 0.988 | <b>0.116</b> | 0.018 |
| Saudi Arabia                    | 0.825                           | 1.000         | 1.000 | 0.019        | 0.012 |
| Slovenia                        | 0.873                           | 0.999         | 0.997 | 0.051        | 0.018 |
| Türkiye                         | 0.796                           | 1.000         | 1.002 | 0.000        | 0.008 |
| United Arab Emirates            | 0.842                           | 0.995         | 0.986 | 0.099        | 0.025 |
| International pooled data       | 0.840                           | 0.998         | 0.994 | 0.079        | 0.015 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.238. Measurement invariance results from MGCFA for scale T4PWELS with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.998     | 0.994 | 0.076 | 0.019 | -                       | -      | -       | -      |
| Equal loadings                | 0.987     | 0.985 | 0.122 | 0.059 | -0.011                  | -0.009 | 0.045   | 0.040  |
| Equal loadings and thresholds | 0.959     | 0.979 | 0.142 | 0.186 | -0.028                  | -0.006 | 0.021   | 0.127  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), Iceland, Malta, the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.239. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PWELS**

| Item    | Slope | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|-------|-------------|-------------|-------------|
| TC4G50A | 0.749 | -1.280      | -0.094      | 0.735       |
| TC4G50B | 0.341 | -1.515      | -0.409      | 1.102       |
| TC4G50C | 0.932 | -0.394      | 0.696       | 1.382       |
| TC4G50D | 0.884 | -0.429      | 0.668       | 1.401       |

Source: OECD, TALIS 2024 database.

### **Workload stress (principal) (T4PWLOAD)**

The principal scale of *Workload stress* (T4PWLOAD) was measured by three items (TC4G51A, TC4G51B and TC4G51C). In these items, principals had to indicate to what extent there were certain sources of stress in their work, using the following response categories: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher values on this scale indicate greater perceived stress related to workload among

principals. Table 11.240 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.241. The model fit indices for T4PWLOAD are not presented here as the scale was measured by just three items. Scale reliabilities for T4PWLOAD are generally above the cut-off criterion, except for the ISCED level 2 population in Czechia, Denmark, France, Italy, Norway, Slovenia and Sweden; the ISCED level 1 population in Belgium, France, New Zealand and Spain; and both the ISCED levels 1 and 3 populations in the Flemish Community of Belgium.

Table 11.242 presents the results from the measurement invariance testing for T4PWLOAD for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit. The equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the RMSEA, but exceeds the cut-offs for the CFI, TLI and SRMR. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.243 presents the standardised item loadings and thresholds based on pooled data for the scale T4PWLOAD. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.240. Items and response categories used in the construction of scale T4PWLOAD**

| Scale or item | Question or item wording                                                                                 |
|---------------|----------------------------------------------------------------------------------------------------------|
| T4PWLOAD      | Thinking about your job at this school, to what extent are the following sources of stress in your work? |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i>   |
|               | Scale mid-point: 2.5                                                                                     |
| TC4G51A       | Having too much teacher appraisal and feedback work to do                                                |
| TC4G51B       | Having too much administrative work to do (e.g. filling out forms)                                       |
| TC4G51C       | Having extra duties due to absent school staff                                                           |

Source: OECD, TALIS 2024 database.

**Table 11.241. Reliability coefficient alpha for single countries and pooled model for scale T4PWLOAD**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.836                           |
| Alberta (Canada)                | 0.762                           |
| Australia                       | 0.733                           |
| Austria                         | 0.697                           |
| Azerbaijan                      | 0.766                           |
| Bahrain                         | 0.810                           |
| Belgium                         | 0.636                           |
| Flemish Community (Belgium)     | 0.618                           |
| French Community (Belgium)      | 0.663                           |
| Brazil                          | 0.818                           |
| Bulgaria                        | 0.774                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Chile                           | 0.808                           |
| Colombia                        | 0.821                           |
| Costa Rica                      | 0.849                           |
| Croatia                         | 0.815                           |
| Cyprus                          | 0.810                           |
| Czechia                         | <b>0.573</b>                    |
| Denmark                         | <b>0.595</b>                    |
| Estonia                         | 0.619                           |
| Finland                         | 0.638                           |
| France                          | <b>0.492</b>                    |
| Hungary                         | 0.789                           |
| Iceland                         | 0.621                           |
| Israel                          | 0.728                           |
| Italy                           | <b>0.491</b>                    |
| Japan                           | 0.769                           |
| Kazakhstan                      | 0.738                           |
| Korea                           | 0.792                           |
| Kosovo                          | 0.778                           |
| Latvia                          | 0.610                           |
| Lithuania                       | 0.697                           |
| Malta                           | 0.676                           |
| Montenegro                      | 0.832                           |
| Morocco                         | 0.716                           |
| Netherlands                     | 0.609                           |
| New Zealand                     | 0.714                           |
| North Macedonia                 | 0.825                           |
| Norway                          | <b>0.587</b>                    |
| Poland                          | 0.724                           |
| Portugal                        | 0.759                           |
| Romania                         | 0.809                           |
| Saudi Arabia                    | 0.797                           |
| Serbia                          | 0.731                           |
| Shanghai (China)                | 0.727                           |
| Singapore                       | 0.818                           |
| Slovak Republic                 | 0.643                           |
| Slovenia                        | <b>0.546</b>                    |
| South Africa                    | 0.719                           |
| Spain                           | 0.670                           |
| Sweden                          | <b>0.592</b>                    |
| Türkiye                         | 0.699                           |
| United Arab Emirates            | 0.799                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| United States                   | 0.621                           |
| Uzbekistan                      | 0.775                           |
| Viet Nam                        | 0.718                           |
| International pooled data       | 0.720                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.661                           |
| Belgium                         | <b>0.540</b>                    |
| Flemish Community (Belgium)     | <b>0.488</b>                    |
| French Community (Belgium)      | 0.627                           |
| Brazil                          | 0.759                           |
| France                          | <b>0.526</b>                    |
| Japan                           | 0.744                           |
| Korea                           | 0.870                           |
| Morocco                         | 0.770                           |
| Netherlands                     | 0.620                           |
| New Zealand                     | <b>0.591</b>                    |
| Saudi Arabia                    | 0.739                           |
| Slovenia                        | 0.642                           |
| Spain                           | <b>0.582</b>                    |
| Türkiye                         | 0.781                           |
| United Arab Emirates            | 0.855                           |
| International pooled data       | 0.686                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.817                           |
| Denmark                         | 0.696                           |
| Flemish Community (Belgium)     | <b>0.515</b>                    |
| Portugal                        | 0.697                           |
| Saudi Arabia                    | 0.779                           |
| Slovenia                        | 0.763                           |
| Türkiye                         | 0.774                           |
| United Arab Emirates            | 0.862                           |
| International pooled data       | 0.766                           |

Note: Coefficients in **bold** exceed the cut-off criterion. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.242. Measurement invariance results from MGCFA for scale T4PWLOAD with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.987     | 0.981 | 0.071 | 0.028 | -0.013                  | -0.019 | 0.071   | 0.028  |
| Equal loadings and thresholds | 0.784     | 0.905 | 0.157 | 0.166 | -0.204                  | -0.076 | 0.086   | 0.138  |

Note: Alberta (Canada), Denmark, the Flemish Community (Belgium), France, the French Community (Belgium), the Netherlands, New Zealand, Norway and Singapore are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.243. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PWLOAD**

| Item    | Slope | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|-------|-------------|-------------|-------------|
| TC4G51A | 0.615 | -0.609      | 0.663       | 1.631       |
| TC4G51B | 0.802 | -1.279      | -0.302      | 0.562       |
| TC4G51C | 0.645 | -0.757      | 0.334       | 1.138       |

Source: OECD, TALIS 2024 database.

### **Job satisfaction with work environment (principal) (T4PJSENV)**

The principal scale of *Job satisfaction with work environment* (T4PJSENV) was measured by a set of three items (TC4G52C, TC4G52E and TC4G52G), described in Table 11.244. Principals had to report their level of agreement to different statements related to their job, with the following available response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Item TC4G52C was reverse coded due to its negative statement about job satisfaction and to ensure it had the same direction as the rest of the items in the scale, with higher values reflecting principals’ higher satisfaction with their work environment.

Scale reliabilities for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.245. The model fit indices for T4PJSENV are not presented here as the scale was measured by just three items. Scale reliabilities for T4PJSENV are generally high across all populations, with most values above 0.700. However, the reliability for the ISCED level 2 population in Slovenia is below the cut-off criterion.

Table 11.246 presents the results from the measurement invariance testing for T4PJSENV for the ISCED level 2 population. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the RMSEA, but exceeds the cut-offs for the CFI, TLI and SRMR, although it is close to the acceptable range for the TLI and SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.247 presents the standardised item loadings and thresholds based on pooled data for the scale T4PJSENV. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.244. Items and response categories used in the construction of scale T4PJSENV**

| Scale or item | Question or item wording                                                                                                          |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------|
| T4PJSENV      | We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements? |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree or disagree; 2=Agree; 3=Strongly agree</i>                        |
|               | Scale mid-point: 2                                                                                                                |
| TC4G52C*      | I would like to change to another school if that were possible.                                                                   |
| TC4G52E       | I enjoy working at this school.                                                                                                   |
| TC4G52G       | I would recommend this school as a good place to work.                                                                            |

Note: \* Item was reverse coded.

Source: OECD, TALIS 2024 database.

**Table 11.245. Reliability coefficient alpha for single countries and pooled model for scale T4PJSENV**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 2</b>            |                                 |
| Albania                         | 0.716                           |
| Alberta (Canada)                | 0.863                           |
| Australia                       | 0.843                           |
| Austria                         | 0.814                           |
| Azerbaijan                      | 0.646                           |
| Bahrain                         | 0.837                           |
| Belgium                         | 0.887                           |
| Flemish Community (Belgium)     | 0.918                           |
| French Community (Belgium)      | 0.845                           |
| Brazil                          | 0.836                           |
| Bulgaria                        | 0.746                           |
| Chile                           | 0.820                           |
| Colombia                        | 0.844                           |
| Costa Rica                      | 0.851                           |
| Croatia                         | 0.821                           |
| Cyprus                          | 0.857                           |
| Czechia                         | 0.758                           |
| Denmark                         | 0.839                           |
| Estonia                         | 0.845                           |
| Finland                         | 0.891                           |
| France                          | 0.782                           |
| Hungary                         | 0.825                           |
| Iceland                         | 0.829                           |
| Israel                          | 0.816                           |
| Italy                           | 0.854                           |
| Japan                           | 0.816                           |
| Kazakhstan                      | 0.666                           |



| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Korea                           | 0.834                           |
| Kosovo                          | 0.682                           |
| Latvia                          | 0.813                           |
| Lithuania                       | 0.885                           |
| Malta                           | 0.862                           |
| Montenegro                      | 0.796                           |
| Morocco                         | 0.745                           |
| Netherlands                     | 0.738                           |
| New Zealand                     | 0.896                           |
| North Macedonia                 | 0.777                           |
| Norway                          | 0.721                           |
| Poland                          | 0.657                           |
| Portugal                        | 0.819                           |
| Romania                         | 0.846                           |
| Saudi Arabia                    | 0.797                           |
| Serbia                          | 0.725                           |
| Shanghai (China)                | 0.787                           |
| Singapore                       | 0.808                           |
| Slovak Republic                 | 0.711                           |
| Slovenia                        | <b>0.585</b>                    |
| South Africa                    | 0.806                           |
| Spain                           | 0.808                           |
| Sweden                          | 0.874                           |
| Türkiye                         | 0.860                           |
| United Arab Emirates            | 0.776                           |
| United States                   | 0.832                           |
| Uzbekistan                      | 0.832                           |
| Viet Nam                        | 0.775                           |
| International pooled data       | 0.815                           |
| <b>ISCED level 1</b>            |                                 |
| Australia                       | 0.838                           |
| Belgium                         | 0.874                           |
| Flemish Community (Belgium)     | 0.865                           |
| French Community (Belgium)      | 0.901                           |
| Brazil                          | 0.821                           |
| France                          | 0.831                           |
| Japan                           | 0.727                           |
| Korea                           | 0.848                           |
| Morocco                         | 0.777                           |
| Netherlands                     | 0.751                           |
| New Zealand                     | 0.786                           |
| Saudi Arabia                    | 0.804                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Slovenia                        | 0.710                           |
| Spain                           | 0.871                           |
| Türkiye                         | 0.895                           |
| United Arab Emirates            | 0.819                           |
| International pooled data       | 0.831                           |
| <b>ISCED level 3</b>            |                                 |
| Croatia                         | 0.823                           |
| Denmark                         | 0.861                           |
| Flemish Community (Belgium)     | 0.892                           |
| Portugal                        | 0.771                           |
| Saudi Arabia                    | 0.787                           |
| Slovenia                        | 0.797                           |
| Türkiye                         | 0.908                           |
| United Arab Emirates            | 0.788                           |
| International pooled data       | 0.828                           |

Note: Coefficients in **bold** exceed the cut-off criterion. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.246. Measurement invariance results from MGCFA for scale T4PJSENV with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.993     | 0.990 | 0.071 | 0.034 | -0.007                  | -0.010 | 0.071   | 0.034  |
| Equal loadings and thresholds | 0.962     | 0.971 | 0.119 | 0.111 | -0.031                  | -0.019 | 0.048   | 0.077  |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.247. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PJSENV**

| Item    | Slope | Threshold 1 | Threshold 2 |
|---------|-------|-------------|-------------|
| TC4G52C | 0.623 | -1.022      | 0.029       |
| TC4G52E | 0.825 | -1.629      | -0.111      |
| TC4G52G | 0.873 | -1.618      | -0.074      |

Source: OECD, TALIS 2024 database.

### Job satisfaction with profession (principal) (T4PJSPROT)

The principal scale of *Job satisfaction with profession* (T4PJSPROT) was measured by a set of four items (TC4G52A, TC4G52B, TC4G52D and TC4G52J), described in Table 11.248. Principals had to report their level of agreement with different statements related to their job, with the following available response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Item TC4G52D was reverse coded due to its negative statement about job satisfaction and to ensure it had the same direction as the rest of the items. Higher values on this scale reflect principals’ higher satisfaction with their profession.

Scale reliabilities and model fit for all populations, as well as for the pooled model per ISCED level, are presented in Table 11.249. Scale reliabilities for T4PJSPROT are generally high across all populations, with most values above 0.800 and none exceeding the cut-off criterion. In terms of model fit for the T4PJSPROT scale, the CFI is at least within the acceptable range across all countries/territories. The TLI is also at least acceptable in most countries/territories, except in the ISCED level 2 population in Kosovo, Montenegro, North Macedonia, Saudi Arabia and Serbia and in the ISCED level 3 population in Türkiye. The RMSEA exceeds the cut-off criterion in 23 of the ISCED level 2 countries/territories (particularly in Denmark, Korea, Lithuania, Malta, Montenegro and Serbia), 4 ISCED level 1 participants (Australia, Morocco, the Netherlands and the United Arab Emirates) and in the ISCED level 3 participants in Croatia, Türkiye and the United Arab Emirates. The SRMR is acceptable across all populations.

Table 11.250 presents the results from the measurement invariance testing for T4PJSPROT for the ISCED level 2 population. The baseline model shows an acceptable model fit across all indices. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA and SRMR. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all indices, although it is close to the acceptable range for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.251 presents the standardised item loadings and thresholds based on pooled data for the scale T4PJSPROT. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.248. Items and response categories used in the construction of scale T4PJSPROT**

| Scale or item | Question or item wording                                                                                                                                                                                                                                              |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T4PJSPROT     | We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?<br><i>Recoded response categories for scaling: 1=Strongly disagree or disagree; 2=Agree; 3=Strongly agree</i><br>Scale mid-point: 2 |
| TC4G52A       | The advantages of this profession clearly outweigh the disadvantages.                                                                                                                                                                                                 |
| TC4G52B       | If I could decide again, I would still choose this job/position.                                                                                                                                                                                                      |
| TC4G52D*      | I regret that I decided to become a principal.                                                                                                                                                                                                                        |
| TC4G52J       | All in all, I am satisfied with my job.                                                                                                                                                                                                                               |

Note: \* Item was reverse coded.

Source: OECD, TALIS 2024 database.

**Table 11.249. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4PJSPROT**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| <b>ISCED level 2</b>            |                  |               |       |              |       |
| Albania                         | 0.725            | 0.991         | 0.972 | 0.056        | 0.034 |
| Alberta (Canada)                | 0.893            | 0.985         | 0.954 | <b>0.174</b> | 0.057 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |              |
|---------------------------------|---------------------------------|---------------|--------------|--------------|--------------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR         |
| Australia                       | 0.910                           | 0.996         | 0.989        | 0.085        | 0.029        |
| Austria                         | 0.883                           | 0.986         | 0.957        | <b>0.130</b> | 0.029        |
| Azerbaijan                      | 0.657                           | 0.992         | 0.975        | 0.045        | 0.039        |
| Bahrain                         | 0.842                           | 0.987         | 0.962        | <b>0.115</b> | 0.027        |
| Belgium                         | 0.877                           | 0.986         | 0.959        | <b>0.141</b> | 0.043        |
| Flemish Community (Belgium)     | 0.891                           | 0.996         | 0.987        | 0.095        | 0.028        |
| French Community (Belgium)      | 0.845                           | 0.982         | 0.945        | <b>0.144</b> | 0.061        |
| Brazil                          | 0.715                           | 0.986         | 0.957        | 0.077        | 0.033        |
| Bulgaria                        | 0.867                           | 1.000         | 1.000        | 0.015        | 0.024        |
| Chile                           | 0.873                           | 1.000         | 1.000        | 0.000        | 0.017        |
| Colombia                        | 0.840                           | 0.974         | 0.921        | <b>0.136</b> | 0.043        |
| Costa Rica                      | 0.777                           | 0.986         | 0.957        | 0.093        | 0.038        |
| Croatia                         | 0.874                           | 1.000         | 1.006        | 0.000        | 0.004        |
| Cyprus                          | 0.853                           | 0.989         | 0.966        | <b>0.163</b> | 0.047        |
| Czechia                         | 0.887                           | 0.999         | 0.998        | 0.036        | 0.015        |
| Denmark                         | 0.893                           | 0.985         | 0.954        | <b>0.203</b> | 0.065        |
| Estonia                         | 0.871                           | 0.991         | 0.973        | <b>0.108</b> | 0.036        |
| Finland                         | 0.927                           | 1.000         | 1.000        | 0.000        | 0.009        |
| France                          | 0.891                           | 0.998         | 0.995        | 0.057        | 0.016        |
| Hungary                         | 0.850                           | 1.000         | 0.999        | 0.019        | 0.019        |
| Iceland                         | 0.919                           | 0.999         | 0.998        | 0.053        | 0.020        |
| Israel                          | 0.877                           | 1.000         | 0.999        | 0.018        | 0.022        |
| Italy                           | 0.863                           | 0.996         | 0.988        | 0.098        | 0.032        |
| Japan                           | 0.904                           | 1.000         | 1.008        | 0.000        | 0.005        |
| Kazakhstan                      | 0.808                           | 0.996         | 0.988        | 0.046        | 0.037        |
| Korea                           | 0.907                           | 0.993         | 0.978        | <b>0.214</b> | 0.051        |
| Kosovo                          | 0.745                           | 0.966         | <b>0.898</b> | <b>0.122</b> | 0.054        |
| Latvia                          | 0.806                           | 0.996         | 0.989        | 0.060        | 0.032        |
| Lithuania                       | 0.877                           | 0.974         | 0.921        | <b>0.184</b> | 0.056        |
| Malta                           | 0.871                           | 0.968         | 0.904        | <b>0.389</b> | <b>0.102</b> |
| Montenegro                      | 0.778                           | 0.947         | <b>0.840</b> | <b>0.180</b> | 0.057        |
| Morocco                         | 0.825                           | 0.995         | 0.985        | 0.048        | 0.024        |
| Netherlands                     | 0.917                           | 0.995         | 0.986        | <b>0.143</b> | 0.051        |
| New Zealand                     | 0.954                           | 1.000         | 1.004        | 0.000        | 0.011        |
| North Macedonia                 | 0.739                           | 0.956         | <b>0.869</b> | <b>0.149</b> | 0.063        |
| Norway                          | 0.901                           | 0.993         | 0.980        | <b>0.131</b> | 0.030        |
| Poland                          | 0.830                           | 0.970         | 0.910        | <b>0.152</b> | 0.047        |
| Portugal                        | 0.781                           | 1.000         | 1.013        | 0.000        | 0.011        |
| Romania                         | 0.835                           | 0.998         | 0.994        | 0.046        | 0.021        |
| Saudi Arabia                    | 0.802                           | 0.964         | <b>0.891</b> | <b>0.175</b> | 0.048        |
| Serbia                          | 0.852                           | 0.966         | <b>0.899</b> | <b>0.203</b> | 0.038        |
| Shanghai (China)                | 0.811                           | 0.992         | 0.975        | 0.086        | 0.031        |
| Singapore                       | 0.916                           | 1.000         | 1.001        | 0.000        | 0.011        |
| Slovak Republic                 | 0.671                           | 0.979         | 0.937        | 0.080        | 0.031        |
| Slovenia                        | 0.885                           | 1.000         | 1.011        | 0.000        | 0.001        |
| South Africa                    | 0.816                           | 0.988         | 0.964        | 0.095        | 0.031        |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Spain                           | 0.792                           | 0.981         | 0.943        | 0.083        | 0.033 |
| Sweden                          | 0.882                           | 0.997         | 0.992        | 0.062        | 0.026 |
| Türkiye                         | 0.846                           | 0.989         | 0.967        | <b>0.105</b> | 0.031 |
| United Arab Emirates            | 0.855                           | 0.978         | 0.933        | <b>0.174</b> | 0.036 |
| United States                   | 0.926                           | 0.996         | 0.988        | <b>0.110</b> | 0.034 |
| Uzbekistan                      | 0.825                           | 1.000         | 0.999        | 0.012        | 0.018 |
| Viet Nam                        | 0.790                           | 0.994         | 0.983        | 0.058        | 0.034 |
| International pooled data       | 0.851                           | 0.992         | 0.977        | 0.080        | 0.020 |
| <b>ISCED level 1</b>            |                                 |               |              |              |       |
| Australia                       | 0.908                           | 0.992         | 0.975        | <b>0.140</b> | 0.039 |
| Belgium                         | 0.842                           | 0.993         | 0.978        | 0.085        | 0.031 |
| Flemish Community (Belgium)     | 0.873                           | 0.996         | 0.988        | 0.076        | 0.026 |
| French Community (Belgium)      | 0.801                           | 1.000         | 1.019        | 0.000        | 0.015 |
| Brazil                          | 0.773                           | 1.000         | 1.001        | 0.000        | 0.017 |
| France                          | 0.859                           | 1.000         | 1.000        | 0.014        | 0.013 |
| Japan                           | 0.911                           | 1.000         | 1.010        | 0.000        | 0.094 |
| Korea                           | 0.901                           | 0.999         | 0.997        | 0.049        | 0.016 |
| Morocco                         | 0.810                           | 0.980         | 0.940        | <b>0.114</b> | 0.039 |
| Netherlands                     | 0.846                           | 0.985         | 0.954        | <b>0.147</b> | 0.022 |
| New Zealand                     | 0.927                           | 1.000         | 1.007        | 0.000        | 0.003 |
| Saudi Arabia                    | 0.803                           | 1.000         | 1.005        | 0.000        | 0.017 |
| Slovenia                        | 0.903                           | 0.998         | 0.995        | 0.059        | 0.015 |
| Spain                           | 0.807                           | 0.981         | 0.942        | 0.083        | 0.034 |
| Türkiye                         | 0.814                           | 1.000         | 1.003        | 0.000        | 0.017 |
| United Arab Emirates            | 0.842                           | 0.985         | 0.954        | <b>0.130</b> | 0.040 |
| International pooled data       | 0.848                           | 0.997         | 0.992        | 0.047        | 0.012 |
| <b>ISCED level 3</b>            |                                 |               |              |              |       |
| Croatia                         | 0.864                           | 0.988         | 0.963        | <b>0.120</b> | 0.040 |
| Denmark                         | 0.884                           | 1.000         | 0.999        | 0.024        | 0.013 |
| Flemish Community (Belgium)     | 0.901                           | 1.000         | 1.001        | 0.000        | 0.016 |
| Portugal                        | 0.756                           | 1.000         | 1.019        | 0.000        | 0.017 |
| Saudi Arabia                    | 0.824                           | 0.995         | 0.986        | 0.073        | 0.027 |
| Slovenia                        | 0.846                           | 0.998         | 0.995        | 0.049        | 0.025 |
| Türkiye                         | 0.807                           | 0.965         | <b>0.896</b> | <b>0.167</b> | 0.062 |
| United Arab Emirates            | 0.850                           | 0.992         | 0.975        | <b>0.106</b> | 0.033 |
| International pooled data       | 0.856                           | 0.994         | 0.982        | 0.085        | 0.023 |

Note: Coefficients in **bold** exceed the cut-off criteria. Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway are excluded from the pooled ISCED level 2 model; the Flemish Community (Belgium), the French Community (Belgium), the Netherlands and New Zealand are excluded from the pooled ISCED level 1 model; the Flemish Community (Belgium) is excluded from the pooled ISCED level 3 model.

Source: OECD, TALIS 2024 database.

**Table 11.250. Measurement invariance results from MGCFA for scale T4PJSPROT with differences in model fits across models for ISCED level 2**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 2</b>          |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.993     | 0.979 | 0.096 | 0.030 | -                       | -      | -       | -      |
| Equal loadings                | 0.983     | 0.980 | 0.093 | 0.057 | -0.009                  | 0.001  | -0.003  | 0.027  |
| Equal loadings and thresholds | 0.957     | 0.967 | 0.119 | 0.134 | -0.027                  | -0.013 | 0.026   | 0.078  |

Note: Albania, Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand, North Macedonia and Norway are excluded from measurement invariance testing.

Source: OECD, TALIS 2024 database.

**Table 11.251. Item loadings and thresholds based on pooled ISCED level 2 data for scale T4PJSPROT**

| Item    | Slope | Threshold 1 | Threshold 2 |
|---------|-------|-------------|-------------|
| TC4G52A | 0.745 | -0.725      | 0.679       |
| TC4G52B | 0.902 | -0.946      | 0.442       |
| TC4G52D | 0.726 | -1.386      | -0.149      |
| TC4G52J | 0.683 | -1.625      | 0.319       |

Source: OECD, TALIS 2024 database.

### 11.4.2. TALIS Starting Strong

#### *Complex scales from the staff questionnaire*

#### **Professional development needs: pedagogical (S2PDNPED)**

The scale *Professional development needs: pedagogical* (S2PDNPED) was measured by a set of seven items (SS2G19A, SS2G19B, SS2G19C, SS2G19D, SS2G19E, SS2G19F and SS2G19G). In these items, ECEC staff had to indicate the extent to which they need professional development in different areas, using the following response categories: “No need at present”, “Low level of need”, “Moderate level of need” and “High level of need”. Higher values on this scale indicate a greater need for professional development in pedagogical matters. Table 11.252 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.253. The scale S2PDNPED has a high reliability that is above 0.85 in all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI, TLI and SRMR show a good fit across all countries/territories while the RMSEA is at least acceptable with the exception of Denmark and Norway in ISCED level 02 where it slightly exceeds the threshold.

Table 11.254 presents the results from the measurement invariance testing for S2PDNPED for both levels. The baseline model fit indices are at least acceptable for both levels. For ISCED level 02, the degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA, SRMR and slightly exceeds the cut-off for the CFI. The change between the equal loadings and equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

For U3, the change between equal loadings and baseline models is within the acceptable range for the RMSEA and SRMR and is close to the cut-off for the CFI and TLI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and close to the cut-off criteria for the CFI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.255 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PDNPED. The loadings for all of the items are high. Results by participating country/territory show a low loading for item SS2G19G in Germany (ISCED level 02).

**Table 11.252. Items and response categories used in the construction of scale S2PDNPED**

| Scale or item | Question or item wording                                                                                                                  |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| S2PDNPED      | For each of the areas listed below, please indicate the extent to which you currently need professional development                       |
|               | <i>Recoded response categories for scaling: 1=No need at present; 2=Low level of need; 3=Moderate level of need; 4=High level of need</i> |
|               | Scale mid-point: 2.5                                                                                                                      |
| SS2G19A       | Theories on the development, well-being and learning of young children                                                                    |
| SS2G19B       | Child health, personal care and safety (e.g. hygiene, allergy, injury prevention)                                                         |
| SS2G19C       | Promoting play and peer interaction                                                                                                       |
| SS2G19D       | Supporting children's early learning of content areas (e.g. language, numeracy, science, art, etc.)                                       |
| SS2G19E       | Supporting children's social and emotional development                                                                                    |
| SS2G19F       | Supporting children's interest to care for the environment                                                                                |
| SS2G19G       | <Classroom/playgroup/group> management                                                                                                    |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.253. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2PDNPED**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |       |              |       |
| Chile                           | 0.928            | 0.994         | 0.991 | 0.054        | 0.019 |
| Colombia                        | 0.946            | 0.988         | 0.981 | 0.086        | 0.028 |
| Denmark                         | 0.894            | 0.970         | 0.955 | <b>0.119</b> | 0.039 |
| Finland                         | 0.916            | 0.983         | 0.974 | 0.084        | 0.029 |
| Flemish Community (Belgium)     | 0.892            | 0.983         | 0.974 | 0.076        | 0.029 |
| Germany                         | 0.854            | 0.989         | 0.984 | 0.057        | 0.026 |
| Ireland                         | 0.958            | 0.994         | 0.990 | 0.084        | 0.023 |
| Israel                          | 0.959            | 0.996         | 0.994 | 0.075        | 0.014 |
| Japan                           | 0.955            | 0.998         | 0.997 | 0.043        | 0.017 |
| Morocco                         | 0.969            | 0.998         | 0.997 | 0.077        | 0.011 |
| Norway                          | 0.914            | 0.986         | 0.979 | <b>0.102</b> | 0.027 |
| New Zealand                     | 0.939            | 0.993         | 0.990 | 0.083        | 0.027 |
| Spain                           | 0.895            | 0.983         | 0.975 | 0.063        | 0.026 |
| Sweden                          | 0.927            | 0.987         | 0.981 | 0.087        | 0.027 |
| Türkiye                         | 0.957            | 0.998         | 0.997 | 0.048        | 0.011 |
| International pooled data       | 0.949            | 0.995         | 0.993 | 0.058        | 0.013 |

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| U3                              |                  |               |       |       |       |
| Canada                          | 0.926            | 0.988         | 0.982 | 0.080 | 0.028 |
| Flemish Community (Belgium)     | 0.873            | 0.971         | 0.957 | 0.094 | 0.041 |
| Germany                         | 0.855            | 0.977         | 0.965 | 0.076 | 0.032 |
| Ireland                         | 0.955            | 0.993         | 0.989 | 0.084 | 0.018 |
| Israel                          | 0.958            | 0.996         | 0.994 | 0.071 | 0.014 |
| Norway                          | 0.924            | 0.992         | 0.988 | 0.081 | 0.027 |
| New Zealand                     | 0.939            | 0.993         | 0.990 | 0.083 | 0.027 |
| International pooled data       | 0.930            | 0.990         | 0.985 | 0.076 | 0.021 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.254. Measurement invariance results from MGCFA for scale S2PDNPED with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.992     | 0.989 | 0.074 | 0.023 | -                       | -      | -       | -      |
| Equal loadings                | 0.987     | 0.986 | 0.081 | 0.042 | -0.005                  | -0.002 | 0.007   | 0.018  |
| Equal loadings and thresholds | 0.975     | 0.984 | 0.089 | 0.104 | -0.012                  | -0.003 | 0.008   | 0.063  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.993     | 0.989 | 0.077 | 0.027 | -                       | -      | -       | -      |
| Equal loadings                | 0.983     | 0.981 | 0.101 | 0.049 | -0.010                  | -0.008 | 0.024   | 0.022  |
| Equal loadings and thresholds | 0.984     | 0.989 | 0.079 | 0.082 | 0.001                   | 0.007  | -0.022  | 0.033  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.255. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PDNPED**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SS2G19A | 0.861   | -0.691      | 0.121       | 1.024       |
| SS2G19B | 0.836   | -0.544      | 0.264       | 1.029       |
| SS2G19C | 0.906   | -0.671      | 0.081       | 0.953       |
| SS2G19D | 0.850   | -0.860      | -0.077      | 0.898       |
| SS2G19E | 0.886   | -0.887      | -0.184      | 0.699       |
| SS2G19F | 0.848   | -0.685      | 0.091       | 0.960       |
| SS2G19G | 0.805   | -0.534      | 0.183       | 1.007       |

Source: OECD, TALIS Starting Strong 2024 database.

### Professional development needs: diversity (S2PDIVR)

The scale *Professional development needs: diversity* (S2PDIVR) was measured by a set of four items (SS2G19J, SS2G19K, SS2G19L and SS2G19M). As with the previous scale, these items asked ECEC staff to indicate the extent to which they need professional development – this time in areas related to



diversity – using the following response categories: “No need at present”, “Low level of need”, “Moderate level of need” and “High level of need”. Higher values on this scale indicate a greater need for professional development in topics related to diversity. Table 11.256 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.257. The scale S2PDIVR has a high reliability that is above 0.79 in all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI, TLI and SRMR show an acceptable or good fit across all countries/territories while the RMSEA exceeds the acceptable range in eight countries/territories.

Table 11.258 presents the results from the measurement invariance testing for S2PDIVR for both levels. The baseline model fit indices are at least acceptable for both levels except for the RMSEA in ISCED level 02. For ISCED level 02, the degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA, SRMR and is close to the cut-off for the CFI. The change between the equal loadings and equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA and close to the cut-off for the CFI. No special caution is required when comparing scale score results across countries/territories.

For U3, the change between equal loadings and baseline models is within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI, TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.259 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PDIVR. The loadings for all of the items are high. Results by participating country/territory show a low loading for item SS2G19J in Spain (ISCED level 02).

**Table 11.256. Items and response categories used in the construction of scale S2PDIVR**

| Scale or item | Question or item wording                                                                                                                  |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| S2PDIVR       | For each of the areas listed below, please indicate the extent to which you currently need professional development                       |
|               | <i>Recoded response categories for scaling: 1=No need at present; 2=Low level of need; 3=Moderate level of need; 4=High level of need</i> |
|               | Scale mid-point: 2.5                                                                                                                      |
| SS2G19J       | Working with <dual/second language learners>                                                                                              |
| SS2G19K       | Working with children with special education needs                                                                                        |
| SS2G19L       | Working with children from disadvantaged backgrounds (e.g. economically disadvantaged, refugee)                                           |
| SS2G19M       | Working with children from diverse backgrounds (e.g. multicultural, religious, sexual or gender minority families)                        |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.257. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2PDIVR**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |       |              |       |
| Chile                           | 0.798            | 1.000         | 1.001 | 0.000        | 0.007 |
| Colombia                        | 0.918            | 0.988         | 0.965 | <b>0.162</b> | 0.028 |
| Denmark                         | 0.881            | 0.973         | 0.918 | <b>0.280</b> | 0.047 |
| Finland                         | 0.881            | 0.999         | 0.997 | 0.054        | 0.009 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Flemish Community (Belgium)     | 0.891                           | 0.996         | 0.989 | <b>0.142</b> | 0.020 |
| Germany                         | 0.849                           | 0.999         | 0.997 | 0.043        | 0.010 |
| Ireland                         | 0.892                           | 1.000         | 1.001 | 0.000        | 0.003 |
| Israel                          | 0.898                           | 0.998         | 0.993 | 0.087        | 0.013 |
| Japan                           | 0.893                           | 0.992         | 0.976 | <b>0.138</b> | 0.034 |
| Morocco                         | 0.869                           | 0.995         | 0.984 | 0.100        | 0.017 |
| Norway                          | 0.902                           | 0.997         | 0.992 | <b>0.107</b> | 0.012 |
| New Zealand                     | 0.840                           | 0.994         | 0.982 | <b>0.121</b> | 0.028 |
| Spain                           | 0.800                           | 1.000         | 0.999 | 0.029        | 0.009 |
| Sweden                          | 0.883                           | 0.997         | 0.992 | 0.091        | 0.015 |
| Türkiye                         | 0.908                           | 0.992         | 0.977 | <b>0.162</b> | 0.027 |
| International pooled data       | 0.882                           | 0.998         | 0.994 | 0.062        | 0.011 |
| <b>U3</b>                       |                                 |               |       |              |       |
| Canada                          | 0.891                           | 0.999         | 0.997 | 0.065        | 0.011 |
| Flemish Community (Belgium)     | 0.923                           | 1.000         | 0.999 | 0.044        | 0.006 |
| Germany                         | 0.869                           | 0.999         | 0.998 | 0.042        | 0.009 |
| Ireland                         | 0.913                           | 1.000         | 1.000 | 0.020        | 0.006 |
| Israel                          | 0.924                           | 0.998         | 0.995 | 0.070        | 0.011 |
| Norway                          | 0.914                           | 0.997         | 0.990 | <b>0.123</b> | 0.018 |
| New Zealand                     | 0.894                           | 0.994         | 0.982 | <b>0.121</b> | 0.028 |
| International pooled data       | 0.906                           | 0.999         | 0.996 | 0.063        | 0.008 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.258. Measurement invariance results from MGCFA for scale S2PDIVR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.995     | 0.984 | 0.125 | 0.018 | -                       | -      | -       | -      |
| Equal loadings                | 0.985     | 0.981 | 0.134 | 0.042 | -0.010                  | -0.003 | 0.009   | 0.024  |
| Equal loadings and thresholds | 0.978     | 0.988 | 0.106 | 0.102 | -0.007                  | 0.007  | -0.028  | 0.060  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.999     | 0.997 | 0.064 | 0.010 | -                       | -      | -       | -      |
| Equal loadings                | 0.996     | 0.995 | 0.078 | 0.024 | -0.003                  | -0.002 | 0.014   | 0.014  |
| Equal loadings and thresholds | 0.993     | 0.996 | 0.072 | 0.067 | -0.003                  | 0.001  | -0.006  | 0.042  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.259. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PDIVR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SS2G19J | 0.691   | -0.832      | -0.159      | 0.741       |
| SS2G19K | 0.735   | -1.102      | -0.486      | 0.383       |
| SS2G19L | 0.919   | -0.769      | -0.109      | 0.790       |
| SS2G19M | 0.908   | -0.711      | 0.030       | 0.972       |

Source: OECD, TALIS Starting Strong 2024 database.

### **Self-efficacy, overall (S2SELF)**

The scale *Self-efficacy, overall* (S2SELF) was measured by a set of ten items (SS2G24A, SS2G24B, SS2G24C, SS2G24D, SS2G24E, SS2G24F, SS2G24G, SS2G24H, SS2G24I and SS2G24J). In these items, ECEC staff were asked to what extent they could do different tasks in their work with children. The available response categories were: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Due to limited variability in responses, the categories “Not at all” and “To some extent” were collapsed into a single category for scaling purposes. Higher values on this scale indicate greater perceived self-efficacy. Table 11.260 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.261. The scale S2SELF has a high reliability that is above 0.85 in all participating countries/territories in both populations. The single country/territory model fit is at least acceptable for all fit indices in all countries/territories.

Table 11.262 presents the results from the measurement invariance testing for S2SELF for both levels. The baseline model fit indices are at least acceptable for both levels. For ISCED level 02, the degree of change between the baseline and the equal loadings models is within the cut-off criteria for all fit indices. The change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria. However, the model fit of the equal loadings and thresholds model is within the acceptable range for all fit indices except for the SRMR. No special caution is required when comparing scale score results across countries/territories.

For U3, the degree of change between the baseline and the equal loadings models is within the cut-off criteria for all fit indices. The change between the equal loadings and the equal loadings and thresholds models is close to the cut-off criteria for the TLI and RMSEA. Furthermore, the model fit of the equal loadings and thresholds model is within the acceptable range for all fit indices except for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.263 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2SELF. The loadings for all of the items are high, with the exception of the loading for item SS2G24H that is moderate. Results by participating country/territory show a low loading for item SS2G24H in Germany (ISCED level 02) and Norway (ISCED levels 02 and U3), as well as a low loading for item SS2G24A in Norway (ISCED level 02).

**Table 11.260. Items and response categories used in the construction of scale S2SELF**

| Scale or item | Question or item wording                                                                        |
|---------------|-------------------------------------------------------------------------------------------------|
| S2SELF        | In your work with children, to what extent do you feel that you can do the following?           |
|               | Recoded response categories for scaling: 1=Not at all or to some extent; 2=Quite a bit; 3=A lot |
|               | Scale mid-point: 2                                                                              |
| SS2G24A       | Support the development of children from disadvantaged backgrounds                              |

| Scale or item | Question or item wording                                                                                        |
|---------------|-----------------------------------------------------------------------------------------------------------------|
| SS2G24B       | Adapt your work to individual child needs                                                                       |
| SS2G24C       | Help children develop their capacity to learn independently                                                     |
| SS2G24D       | Help children prepare for transitioning to other <ECEC settings> or to <ISCED 2011 level 1> schools             |
| SS2G24E       | Stimulate children's interest in cultural differences and commonalities                                         |
| SS2G24F       | Help children to interact with each other and show good social behaviour (e.g. sharing, helping others)         |
| SS2G24G       | Help children develop creativity and problem solving                                                            |
| SS2G24H       | Use <digital resources and tools> to facilitate working with children                                           |
| SS2G24I       | Provide all children with a feeling of security                                                                 |
| SS2G24J       | Use a variety of monitoring and assessment strategies to follow children's development, well-being and learning |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.261. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2SELF**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                  |               |       |       |       |
| Chile                           | 0.917            | 0.956         | 0.944 | 0.082 | 0.062 |
| Colombia                        | 0.923            | 0.950         | 0.935 | 0.075 | 0.074 |
| Denmark                         | 0.898            | 0.965         | 0.955 | 0.080 | 0.054 |
| Finland                         | 0.894            | 0.948         | 0.934 | 0.081 | 0.057 |
| Flemish Community (Belgium)     | 0.883            | 0.956         | 0.944 | 0.075 | 0.061 |
| Germany                         | 0.858            | 0.938         | 0.921 | 0.081 | 0.066 |
| Ireland                         | 0.932            | 0.970         | 0.962 | 0.064 | 0.063 |
| Israel                          | 0.945            | 0.976         | 0.970 | 0.100 | 0.053 |
| Japan                           | 0.947            | 0.986         | 0.982 | 0.068 | 0.038 |
| Morocco                         | 0.907            | 0.952         | 0.938 | 0.072 | 0.063 |
| Norway                          | 0.880            | 0.987         | 0.984 | 0.045 | 0.049 |
| New Zealand                     | 0.911            | 0.954         | 0.941 | 0.092 | 0.091 |
| Spain                           | 0.912            | 0.963         | 0.953 | 0.069 | 0.053 |
| Sweden                          | 0.912            | 0.966         | 0.957 | 0.082 | 0.064 |
| Türkiye                         | 0.934            | 0.971         | 0.963 | 0.083 | 0.057 |
| International pooled data       | 0.927            | 0.976         | 0.970 | 0.064 | 0.046 |
| U3                              |                  |               |       |       |       |
| Canada                          | 0.922            | 0.971         | 0.963 | 0.068 | 0.056 |
| Flemish Community (Belgium)     | 0.916            | 0.978         | 0.972 | 0.063 | 0.062 |
| Germany                         | 0.852            | 0.926         | 0.905 | 0.078 | 0.061 |
| Ireland                         | 0.924            | 0.952         | 0.939 | 0.091 | 0.082 |
| Israel                          | 0.955            | 0.979         | 0.973 | 0.088 | 0.049 |
| Norway                          | 0.897            | 0.962         | 0.951 | 0.085 | 0.070 |
| New Zealand                     | 0.913            | 0.954         | 0.941 | 0.092 | 0.091 |
| International pooled data       | 0.917            | 0.963         | 0.952 | 0.073 | 0.056 |

Note: New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.262. Measurement invariance results from MGCFA for scale S2SELF with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.969     | 0.960 | 0.076 | 0.058 | -                       | -      | -       | -      |
| Equal loadings                | 0.973     | 0.972 | 0.062 | 0.068 | 0.005                   | 0.013  | -0.013  | 0.010  |
| Equal loadings and thresholds | 0.924     | 0.934 | 0.097 | 0.121 | -0.049                  | -0.038 | 0.034   | 0.053  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.973     | 0.966 | 0.080 | 0.063 | -                       | -      | -       | -      |
| Equal loadings                | 0.977     | 0.975 | 0.068 | 0.076 | 0.003                   | 0.009  | -0.012  | 0.013  |
| Equal loadings and thresholds | 0.959     | 0.963 | 0.083 | 0.109 | -0.018                  | -0.012 | 0.015   | 0.033  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.263. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2SELF**

| Item    | Loading | Threshold 1 | Threshold 2 |
|---------|---------|-------------|-------------|
| SS2G24A | 0.691   | -0.473      | 0.688       |
| SS2G24B | 0.756   | -0.795      | 0.420       |
| SS2G24C | 0.841   | -1.148      | 0.172       |
| SS2G24D | 0.715   | -0.790      | 0.291       |
| SS2G24E | 0.730   | -0.394      | 0.707       |
| SS2G24F | 0.902   | -1.540      | -0.312      |
| SS2G24G | 0.882   | -1.382      | -0.056      |
| SS2G24H | 0.585   | -0.012      | 0.869       |
| SS2G24I | 0.793   | -1.587      | -0.427      |
| SS2G24J | 0.732   | -0.834      | 0.315       |

Source: OECD, TALIS Starting Strong 2024 database.

### **Self-efficacy: children's development, well-being and learning (S2SELF)**

The scale *Self-efficacy: children's development, well-being and learning* (S2SELF) was measured by six of the ten items used in S2SELF, specifically items SS2G24B, SS2G24C, SS2G24F, SS2G24G, SS2G24I and SS2G24J. As in the previous scale, ECEC staff were asked to what extent they could do different tasks in their work with children. The available response categories were: "Not at all", "To some extent", "Quite a bit" and "A lot". Due to limited variability in responses, the categories "Not at all" and "To some extent" were collapsed into a single category for scaling purposes. Higher values on this scale indicate greater perceived self-efficacy in tasks related to children's development, well-being and learning. Table 11.264 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.265. The scale S2SELF has a high reliability that is above 0.83 in all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI, TLI and SRMR show a good fit across all countries/territories while the RMSEA is at least acceptable with the exception of Chile, Colombia, Finland, Israel, New Zealand, Sweden and Türkiye in ISCED level 02 and Canada, Germany, Ireland and New Zealand for U3. In these countries, the RMSEA ranges between 0.10 and 0.12.

Table 11.266 presents the results from the measurement invariance testing for S2SELFC for both levels. The baseline model fit indices are at least acceptable for both levels. For ISCED level 02, the degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The change between the equal loadings and equal loadings and thresholds models is close to the acceptable range for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

For U3, the change between equal loadings and baseline models is within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and close to the cut-off criteria for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.267 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2SELFC. The loadings for all of the items are high for the pooled model as well as in single countries/territories.

**Table 11.264. Items and response categories used in the construction of scale S2SELFC**

| Scale or item | Question or item wording                                                                                        |
|---------------|-----------------------------------------------------------------------------------------------------------------|
| S2SELFC       | In your work with children, to what extent do you feel that you can do the following?                           |
|               | <i>Recoded response categories for scaling: 1=Not at all or to some extent; 2=Quite a bit; 3=A lot</i>          |
|               | Scale mid-point: 2                                                                                              |
| SS2G24B       | Adapt your work to individual child needs                                                                       |
| SS2G24C       | Help children develop their capacity to learn independently                                                     |
| SS2G24F       | Help children to interact with each other and show good social behaviour (e.g. sharing, helping others)         |
| SS2G24G       | Help children develop creativity and problem solving                                                            |
| SS2G24I       | Provide all children with a feeling of security                                                                 |
| SS2G24J       | Use a variety of monitoring and assessment strategies to follow children's development, well-being and learning |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.265. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2SELFC**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                  |               |       |       |       |
| Chile                           | 0.907            | 0.964         | 0.940 | 0.118 | 0.055 |
| Colombia                        | 0.922            | 0.963         | 0.939 | 0.121 | 0.070 |
| Denmark                         | 0.880            | 0.981         | 0.968 | 0.095 | 0.043 |
| Finland                         | 0.867            | 0.958         | 0.929 | 0.109 | 0.053 |
| Flemish Community (Belgium)     | 0.872            | 0.975         | 0.958 | 0.093 | 0.045 |
| Germany                         | 0.847            | 0.981         | 0.968 | 0.077 | 0.040 |
| Ireland                         | 0.925            | 0.969         | 0.949 | 0.094 | 0.045 |
| Israel                          | 0.939            | 0.987         | 0.979 | 0.124 | 0.037 |
| Japan                           | 0.940            | 0.991         | 0.985 | 0.096 | 0.028 |
| Morocco                         | 0.901            | 0.987         | 0.978 | 0.055 | 0.036 |
| Norway                          | 0.892            | 0.994         | 0.990 | 0.056 | 0.029 |
| New Zealand                     | 0.904            | 0.948         | 0.921 | 0.114 | 0.092 |
| Spain                           | 0.909            | 0.977         | 0.962 | 0.090 | 0.044 |
| Sweden                          | 0.899            | 0.976         | 0.960 | 0.114 | 0.058 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Türkiye                         | 0.920                           | 0.978         | 0.963 | <b>0.121</b> | 0.058 |
| International pooled data       | 0.919                           | 0.987         | 0.978 | 0.081        | 0.034 |
| <b>U3</b>                       |                                 |               |       |              |       |
| Canada                          | 0.899                           | 0.976         | 0.960 | <b>0.104</b> | 0.048 |
| Flemish Community (Belgium)     | 0.920                           | 0.991         | 0.986 | 0.068        | 0.034 |
| Germany                         | 0.836                           | 0.944         | 0.907 | <b>0.106</b> | 0.050 |
| Ireland                         | 0.912                           | 0.970         | 0.951 | <b>0.114</b> | 0.060 |
| Israel                          | 0.949                           | 0.991         | 0.985 | 0.096        | 0.026 |
| Norway                          | 0.894                           | 0.986         | 0.976 | 0.090        | 0.038 |
| New Zealand                     | 0.907                           | 0.948         | 0.921 | <b>0.114</b> | 0.092 |
| International pooled data       | 0.907                           | 0.978         | 0.963 | 0.091        | 0.036 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.266. Measurement invariance results from MGCFA for scale S2SELFC with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.980     | 0.967 | 0.100 | 0.046 | -                       | -      | -       | -      |
| Equal loadings                | 0.981     | 0.979 | 0.080 | 0.056 | 0.000                   | 0.012  | -0.020  | 0.010  |
| Equal loadings and thresholds | 0.956     | 0.964 | 0.105 | 0.103 | -0.025                  | -0.015 | 0.025   | 0.047  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.985     | 0.975 | 0.098 | 0.043 | -                       | -      | -       | -      |
| Equal loadings                | 0.985     | 0.983 | 0.081 | 0.056 | -0.000                  | 0.008  | -0.017  | 0.013  |
| Equal loadings and thresholds | 0.977     | 0.980 | 0.087 | 0.087 | -0.007                  | -0.002 | 0.005   | 0.032  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.267. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2SELFC**

| Item    | Loading | Threshold 1 | Threshold 2 |
|---------|---------|-------------|-------------|
| SS2G24B | 0.736   | -0.795      | 0.420       |
| SS2G24C | 0.840   | -1.149      | 0.172       |
| SS2G24F | 0.916   | -1.540      | -0.313      |
| SS2G24G | 0.893   | -1.382      | -0.056      |
| SS2G24I | 0.810   | -1.587      | -0.427      |
| SS2G24J | 0.713   | -0.834      | 0.315       |

Source: OECD, TALIS Starting Strong 2024 database.

### Facilitating play (S2PRINTR)

The scale *Facilitating play* (S2PRINTR) was constructed using three items (SS2G32A, SS2G32B and SS2G32C). In this set of items, ECEC staff were asked how frequently they performed different activities with the children at the ECEC setting during the most recent week. The available response options were:

“Not at all”, “Once a week”, “A few times a week”, “Once a day” and “More than once a day”. Higher values on this scale reflect more frequent activities to facilitate play among children. Table 11.268 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for both populations, as well as for the pooled model per level, are presented in Table 11.269. The fit indices for the S2PRINTR scale are not presented here as the scale was measured by just three items, resulting in a model that is just identified and therefore shows a perfect fit. The scale S2PRINTR has a high reliability that is above 0.75 in all participating countries/territories in both populations.

Table 11.270 presents the results from the measurement invariance testing for S2PRINTR for both levels. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. The equal loadings model fit indices are at least acceptable for both levels. For ISCED level 02, the degree of change between the equal loadings and equal loadings and thresholds models exceeds the thresholds. However, the model fit of the equal loadings and thresholds model is within the acceptable range for the TLI and close to an acceptable range for the CFI, RMSEA and SRMR. No special caution is required when comparing scale score results across countries/territories.

For U3, the degree of change between the equal loadings and equal loadings and thresholds is within the acceptable range for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.269 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PRINTR. The loadings for all of the items are high for the pooled model as well as in single countries/territories.

**Table 11.268. Items and response categories used in the construction of S2PRINTR**

| Scale or item | Question or item wording                                                                                                                |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| S2PRINTR      | How often did you do the following at this <ECEC setting>, during your most recent complete calendar week?                              |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=Once a week; 3=A few times a week; 4=Once a day; 5=More than once a day</i> |
|               | Scale mid-point: 3                                                                                                                      |
| SS2G32A       | Allowed children to take the lead when I played with them                                                                               |
| SS2G32B       | Responded positively to non-verbal invitations to play (e.g. a child passing me a toy)                                                  |
| SS2G32C       | Let a child play alone if they were deeply engaged in play                                                                              |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.269. Reliability coefficient alpha for single countries/territories and pooled model for scale S2PRINTR**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 02</b>           |                                 |
| Chile                           | 0.822                           |
| Colombia                        | 0.830                           |
| Denmark                         | 0.751                           |
| Finland                         | 0.823                           |
| Flemish Community (Belgium)     | 0.813                           |
| Germany                         | 0.782                           |
| Ireland                         | 0.857                           |



| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Israel                          | 0.850                           |
| Japan                           | 0.767                           |
| Morocco                         | 0.764                           |
| Norway                          | 0.785                           |
| New Zealand                     | 0.956                           |
| Spain                           | 0.849                           |
| Sweden                          | 0.843                           |
| Türkiye                         | 0.783                           |
| International pooled data       | 0.820                           |
| <b>U3</b>                       |                                 |
| Canada                          | 0.912                           |
| Flemish Community (Belgium)     | 0.858                           |
| Germany                         | 0.798                           |
| Ireland                         | 0.882                           |
| Israel                          | 0.868                           |
| Norway                          | 0.831                           |
| New Zealand                     | 0.879                           |
| International pooled data       | 0.861                           |

Note: New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.270. Measurement invariance results from MGCFA for scale S2PRINTR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.993     | 0.989 | 0.066 | 0.016 | -0.007                  | -0.011 | 0.066   | 0.016  |
| Equal loadings and thresholds | 0.895     | 0.966 | 0.117 | 0.119 | -0.098                  | -0.023 | 0.051   | 0.103  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.992     | 0.986 | 0.093 | 0.024 | -0.008                  | -0.014 | 0.093   | 0.024  |
| Equal loadings and thresholds | 0.969     | 0.989 | 0.082 | 0.095 | -0.023                  | 0.003  | -0.011  | 0.071  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.271. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PRINTR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SS2G32A | 0.790   | -1.681      | -1.207      | -0.355      | 0.075       |
| SS2G32B | 0.851   | -1.622      | -1.283      | -0.537      | -0.185      |
| SS2G32C | 0.660   | -1.475      | -1.108      | -0.355      | 0.082       |

Source: OECD, TALIS Starting Strong 2024 database.

### Facilitating prosocial behaviour (S2PRSOC)

The scale *Facilitating prosocial behaviour* (S2PRSOC) was constructed using ECEC staff responses to four items (SS2G31A, SS2G31B, SS2G31C and SS2G31D). These items focused on the frequency to which ECEC staff performed different activities with the children at the ECEC setting during the most recent week. The available response options were: “Not at all”, “Once a week”, “A few times a week”, “Once a day” and “More than once a day”. Higher values on this scale indicate a higher frequency of activities that facilitate prosocial behaviour among children. Table 11.272 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.273. The scale S2PRSOC has a high reliability that is above 0.89 in all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI, TLI and SRMR show a good fit across all countries/territories while the RMSEA is at least acceptable in only four countries/territories.

Table 11.274 presents the results from the measurement invariance testing for S2PRSOC for both levels. The baseline model fit indices are at least acceptable for both levels with the exception of the RMSEA that exceeds the cut-off. For ISCED level 02, the degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The change between the equal loadings and equal loadings and thresholds models is within the acceptable range for all but the SRMR. No special caution is required when comparing scale score results across countries/territories.

For U3, the change between equal loadings and baseline models is within the acceptable range. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for all fit indices with the exception of the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.275 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PRSOC. The loadings for all of the items are high for the pooled model as well as in single countries/territories.

**Table 11.272. Items and response categories used in the construction of scale S2PRSOC**

| Scale or item | Question or item wording                                                                                                                |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| S2PRSOC       | How often did you do the following at this <ECEC setting>, during your most recent complete calendar week?                              |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=Once a week; 3=A few times a week; 4=Once a day; 5=More than once a day</i> |
|               | Scale mid-point: 3                                                                                                                      |
| SS2G31A       | Encouraged sharing amongst children                                                                                                     |
| SS2G31B       | Encouraged children if they helped each other                                                                                           |
| SS2G31C       | Encouraged children playing in small groups to include other children                                                                   |
| SS2G31D       | Encouraged children if they comforted each other                                                                                        |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.273. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2PRSOC**

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |       |       |
|---------------------------------|---------------------------------|---------------|-------|-------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                                 |               |       |       |       |
| Chile                           | 0.934                           | 1.000         | 0.999 | 0.035 | 0.008 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Colombia                        | 0.976                           | 0.997         | 0.992 | <b>0.127</b> | 0.012 |
| Denmark                         | 0.922                           | 0.991         | 0.973 | <b>0.143</b> | 0.024 |
| Finland                         | 0.927                           | 0.993         | 0.978 | <b>0.152</b> | 0.019 |
| Flemish Community (Belgium)     | 0.931                           | 0.990         | 0.970 | <b>0.164</b> | 0.025 |
| Germany                         | 0.919                           | 0.993         | 0.980 | <b>0.155</b> | 0.017 |
| Ireland                         | 0.947                           | 0.998         | 0.994 | 0.071        | 0.026 |
| Israel                          | 0.980                           | 1.000         | 0.999 | 0.098        | 0.003 |
| Japan                           | 0.913                           | 0.983         | 0.949 | <b>0.234</b> | 0.036 |
| Morocco                         | 0.922                           | 0.992         | 0.976 | <b>0.154</b> | 0.015 |
| Norway                          | 0.941                           | 0.993         | 0.978 | <b>0.173</b> | 0.028 |
| New Zealand                     | 0.958                           | 1.000         | 1.000 | 0.000        | 0.000 |
| Spain                           | 0.967                           | 0.998         | 0.994 | <b>0.133</b> | 0.018 |
| Sweden                          | 0.942                           | 0.994         | 0.983 | <b>0.132</b> | 0.025 |
| Türkiye                         | 0.945                           | 0.995         | 0.985 | <b>0.199</b> | 0.023 |
| International pooled data       | 0.944                           | 0.989         | 0.966 | <b>0.125</b> | 0.018 |
| <b>U3</b>                       |                                 |               |       |              |       |
| Canada                          | 0.967                           | 0.998         | 0.993 | 0.098        | 0.012 |
| Flemish Community (Belgium)     | 0.937                           | 1.000         | 0.999 | 0.036        | 0.011 |
| Germany                         | 0.897                           | 0.989         | 0.968 | <b>0.181</b> | 0.027 |
| Ireland                         | 0.960                           | 0.999         | 0.997 | 0.068        | 0.013 |
| Israel                          | 0.949                           | 0.999         | 0.997 | 0.062        | 0.008 |
| Norway                          | 0.915                           | 0.997         | 0.992 | 0.072        | 0.019 |
| New Zealand                     | 0.933                           | 1.000         | 1.000 | 0.000        | 0.000 |
| International pooled data       | 0.940                           | 0.997         | 0.992 | 0.088        | 0.011 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.274. Measurement invariance results from MGCFA for scale S2PRSOC with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |       |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|-------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.997     | 0.992 | 0.138 | 0.019 | -                       | -     | -       | -      |
| Equal loadings                | 0.997     | 0.996 | 0.100 | 0.026 | -0.001                  | 0.004 | -0.037  | 0.007  |
| Equal loadings and thresholds | 0.994     | 0.998 | 0.076 | 0.100 | -0.003                  | 0.002 | -0.024  | 0.074  |
| <b>U3</b>                     |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.997     | 0.991 | 0.111 | 0.015 | -                       | -     | -       | -      |
| Equal loadings                | 0.993     | 0.991 | 0.111 | 0.030 | -0.003                  | 0.000 | -0.000  | 0.015  |
| Equal loadings and thresholds | 0.989     | 0.995 | 0.084 | 0.089 | -0.004                  | 0.004 | -0.027  | 0.059  |

Note: New Zealand and Norway are excluded from measurement invariance testing in the ISCED level 02 population; Canada, New Zealand and Norway are excluded from measurement invariance testing in the U3 population.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.275. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PRSOC**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SS2G31A | 0.904   | -2.179      | -1.760      | -0.988      | -0.690      |
| SS2G31B | 0.958   | -2.397      | -1.965      | -1.128      | -0.801      |
| SS2G31C | 0.877   | -1.865      | -1.543      | -0.796      | -0.420      |
| SS2G31D | 0.888   | -1.886      | -1.479      | -0.724      | -0.375      |

Source: OECD, TALIS Starting Strong 2024 database.

### Facilitating emotional development (S2PREMR)

The scale *Facilitating emotional development* (S2PREMR) was developed based on three items (SS2G33A, SS2G33B and SS2G33D), which assessed the frequency to which ECEC staff performed different activities with the children at the ECEC setting during the most recent week. The available response options were: “Not at all”, “Once a week”, “A few times a week”, “Once a day” and “More than once a day”. Higher values on this scale reflect more frequent activities to facilitate the emotional development of children. Table 11.276 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for both populations, as well as for the pooled model per level, are presented in Table 11.277. The fit indices for the S2PREMR scale are not presented here as the scale was measured by just three items, resulting in a model that is just identified and therefore shows a perfect fit. The scale S2PREMR has a high reliability that is above 0.88 in all participating countries/territories in both populations.

Table 11.278 presents the results from the measurement invariance testing for S2PREMR for both levels. As this is a three-item scale, the baseline model has a perfect fit for both levels because it is just identified. For ISCED level 02, the equal loadings model has an acceptable model fit and the degree of change between the equal loadings model and equal loadings and thresholds model is within the cut-off criteria for the CFI, TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

For U3, the change between equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA and close to the cut-off criteria for the CFI. No special caution is required when comparing scale score results across countries/territories.

Table 11.279 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PREMR. The loadings for all of the items are high for the pooled model as well as in single countries/territories.

**Table 11.276. Items and response categories used in the construction of scale S2PREMR**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                    |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2PREMR       | How often did you do the following at this <ECEC setting>, during your most recent complete calendar week?<br><i>Recoded response categories for scaling: 1=Not at all; 2=Once a week; 3=A few times a week; 4=Once a day; 5=More than once a day</i><br>Scale mid-point: 3 |
| SS2G33A       | Talked with children about feelings                                                                                                                                                                                                                                         |
| SS2G33B       | Helped children understand their feelings (e.g. when they are excited)                                                                                                                                                                                                      |
| SS2G33D       | Helped children express their feelings                                                                                                                                                                                                                                      |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.277. Reliability coefficient alpha for single countries/territories and pooled model for scale S2PREMR**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 02</b>           |                                 |
| Chile                           | 0.952                           |
| Colombia                        | 0.959                           |
| Denmark                         | 0.940                           |
| Finland                         | 0.940                           |
| Flemish Community (Belgium)     | 0.939                           |
| Germany                         | 0.918                           |
| Ireland                         | 0.942                           |
| Israel                          | 0.951                           |
| Japan                           | 0.907                           |
| Morocco                         | 0.883                           |
| Norway                          | 0.921                           |
| New Zealand                     | 0.982                           |
| Spain                           | 0.961                           |
| Sweden                          | 0.939                           |
| Türkiye                         | 0.910                           |
| International pooled data       | 0.939                           |
| <b>U3</b>                       |                                 |
| Canada                          | 0.945                           |
| Flemish Community (Belgium)     | 0.922                           |
| Germany                         | 0.920                           |
| Ireland                         | 0.924                           |
| Israel                          | 0.933                           |
| Norway                          | 0.928                           |
| New Zealand                     | 0.970                           |
| International pooled data       | 0.938                           |

Note: New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.278. Measurement invariance results from MGCFA for scale S2PREMR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.999     | 0.999 | 0.053 | 0.008 | -0.001                  | -0.001 | 0.053   | 0.008  |
| Equal loadings and thresholds | 0.996     | 0.999 | 0.057 | 0.081 | -0.003                  | -0.000 | 0.004   | 0.073  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 1.000     | 0.999 | 0.042 | 0.010 | -0.000                  | -0.001 | 0.042   | 0.010  |

| Invariance model              | Model fit |       |       |       | Difference in model fit |              |                |               |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------------|----------------|---------------|
|                               | CFI       | TLI   | RMSEA | SRMR  | $\Delta$ CFI            | $\Delta$ TLI | $\Delta$ RMSEA | $\Delta$ SRMR |
| Equal loadings and thresholds | 0.995     | 0.998 | 0.062 | 0.077 | -0.005                  | -0.001       | 0.020          | 0.068         |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.279. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PREMR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SS2G33A | 0.896   | -2.015      | -1.444      | -0.566      | -0.183      |
| SS2G33B | 0.969   | -2.052      | -1.485      | -0.615      | -0.227      |
| SS2G33D | 0.869   | -2.237      | -1.731      | -0.873      | -0.518      |

Source: OECD, TALIS Starting Strong 2024 database.

### Child-centred planning (S2CCAFL)

ECEC staff answered four items measuring their *Child-centred planning* (S2CCAFL). These items (SS2G32D, SS2G32E, SS2G32F and SS2G32G) focused on how frequently staff engaged in various planning activities during the most recent week. Response options included: “Not at all”, “Once a week”, “A few times a week”, “Once a day” and “More than once a day”. Higher scores on this scale indicate a greater use of child-centred approaches to planning. Table 11.280 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.281. The scale S2CCAFL has a high reliability that is above 0.76 in all participating countries/territories in both populations. The single country/territory model fit are showing good fit based on the CFI and SRMR. The TLI is below 0.95 in the ISCED level 02 population in the Flemish Community of Belgium, Germany and Türkiye. The RMSEA exceeds the cut-off in four countries/territories of ISCED level 02 and U3, each.

Table 11.282 presents the results from the measurement invariance testing for S2CCAFL for both levels. The baseline model fit indices are at least acceptable for both levels based on the CFI, TLI and SRMR. For ISCED level 02, the degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The change between the equal loadings and equal loadings and thresholds models exceeds the thresholds for all fit indices. However, the equal loadings and thresholds model shows a good TLI and close-to-acceptable CFI and RMSEA. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

For U3, the change between equal loadings and baseline models is within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-offs for all fit indices. However, the equal loadings and thresholds model shows good or acceptable CFI, TLI and RMSEA, with the SRMR being close to acceptable. No special caution is required when comparing scale score results across countries/territories.

Table 11.283 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2CCAFL. The loadings for all of the items are high for the pooled model as well as in single countries/territories.

Table 11.280. Items and response categories used in the construction of scale S2CCAFL

| Scale or item | Question or item wording                                                                                                                |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| S2CCAFL       | How often did you do the following at this <ECEC setting>, during your most recent complete calendar week?                              |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=Once a week; 3=A few times a week; 4=Once a day; 5=More than once a day</i> |
|               | Scale mid-point: 3                                                                                                                      |
| SS2G32D       | Intentionally organised the <classroom/playgroup/group> to facilitate children's exploration and play                                   |
| SS2G32E       | Planned activities designed to allow children to take the initiative                                                                    |
| SS2G32F       | Involved children in making plans for the day                                                                                           |
| SS2G32G       | Adapted daily activities in response to children's natural rhythms (e.g. hunger, fatigue)                                               |

Source: OECD, TALIS Starting Strong 2024 database.

Table 11.281. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2CCAFL

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |              |              |       |
| Chile                           | 0.865            | 1.000         | 0.999        | 0.018        | 0.007 |
| Colombia                        | 0.868            | 0.990         | 0.970        | 0.082        | 0.018 |
| Denmark                         | 0.779            | 0.990         | 0.970        | 0.093        | 0.021 |
| Finland                         | 0.766            | 0.998         | 0.993        | 0.040        | 0.010 |
| Flemish Community (Belgium)     | 0.832            | 0.964         | <b>0.893</b> | <b>0.225</b> | 0.045 |
| Germany                         | 0.810            | 0.969         | 0.906        | <b>0.184</b> | 0.030 |
| Ireland                         | 0.871            | 0.994         | 0.983        | 0.080        | 0.017 |
| Israel                          | 0.918            | 0.988         | 0.963        | <b>0.193</b> | 0.017 |
| Japan                           | 0.841            | 0.999         | 0.997        | 0.030        | 0.008 |
| Morocco                         | 0.813            | 0.997         | 0.992        | 0.058        | 0.009 |
| Norway                          | 0.861            | 0.995         | 0.986        | 0.097        | 0.018 |
| New Zealand                     | 0.907            | 1.000         | 1.000        | 0.000        | 0.000 |
| Spain                           | 0.879            | 0.996         | 0.988        | 0.067        | 0.016 |
| Sweden                          | 0.815            | 0.986         | 0.959        | 0.097        | 0.023 |
| Türkiye                         | 0.869            | 0.975         | 0.924        | <b>0.183</b> | 0.033 |
| International pooled data       | 0.854            | 0.989         | 0.966        | 0.096        | 0.019 |
| U3                              |                  |               |              |              |       |
| Canada                          | 0.841            | 0.988         | 0.963        | 0.094        | 0.016 |
| Flemish Community (Belgium)     | 0.779            | 0.986         | 0.958        | 0.088        | 0.035 |
| Germany                         | 0.796            | 0.983         | 0.950        | <b>0.128</b> | 0.027 |
| Ireland                         | 0.869            | 0.986         | 0.958        | <b>0.118</b> | 0.020 |
| Israel                          | 0.872            | 0.991         | 0.972        | <b>0.112</b> | 0.019 |
| Norway                          | 0.822            | 0.989         | 0.967        | <b>0.107</b> | 0.027 |
| New Zealand                     | 0.882            | 1.000         | 1.000        | 0.000        | 0.000 |
| International pooled data       | 0.833            | 0.988         | 0.965        | 0.095        | 0.022 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.282. Measurement invariance results from MGCFA for scale S2CCAFL with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.987     | 0.962 | 0.122 | 0.020 | -                       | -      | -       | -      |
| Equal loadings                | 0.984     | 0.980 | 0.090 | 0.029 | -0.004                  | 0.017  | -0.032  | 0.009  |
| Equal loadings and thresholds | 0.895     | 0.958 | 0.129 | 0.130 | -0.089                  | -0.022 | 0.039   | 0.102  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.989     | 0.967 | 0.107 | 0.024 | -                       | -      | -       | -      |
| Equal loadings                | 0.987     | 0.983 | 0.076 | 0.035 | -0.002                  | 0.016  | -0.031  | 0.010  |
| Equal loadings and thresholds | 0.931     | 0.970 | 0.101 | 0.113 | -0.056                  | -0.013 | 0.025   | 0.079  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.283. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2CCAFL**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SS2G32D | 0.801   | -1.346      | -0.957      | -0.246      | 0.236       |
| SS2G32E | 0.880   | -1.403      | -0.927      | -0.125      | 0.367       |
| SS2G32F | 0.742   | -0.977      | -0.529      | 0.131       | 0.618       |
| SS2G32G | 0.651   | -1.269      | -0.981      | -0.344      | 0.038       |

Source: OECD, TALIS Starting Strong 2024 database.

### Daily adaptive pedagogical practices (S2PRACTR)

To assess their *Daily adaptive pedagogical practices* (S2PRACTR), ECEC staff responded to five items (SS2G40A, SS2G40B, SS2G40C, SS2G40E and SS2G40F) that asked how often they engaged in specific activities with the target group on a given day. The available response options were: “Never”, “Rarely”, “Occasionally”, “Often” and “Always”. Higher values on this scale reflect more frequent use of daily adaptive pedagogical practices. Table 11.284 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.285. The scale S2PRACTR has a high reliability that is above 0.76 in all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI, TLI and SRMR show a good fit across all countries/territories, while the RMSEA exceeds the cut-off for six ISCED level 02 countries/territories (the Flemish Community of Belgium, Germany, Morocco, New Zealand, Norway and Türkiye) and five U3 countries/territories (Canada, the Flemish Community of Belgium, Germany, Ireland and New Zealand). The RMSEA of the pooled model for the U3 population is also slightly above the acceptable cut-off.

Table 11.286 presents the results from the measurement invariance testing for S2PRACTR for both levels. The baseline model fit indices are at least acceptable for both levels with the RMSEA close to the acceptable criterion in U3. For ISCED level 02, the degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The change between the equal loadings and equal loadings and thresholds models exceeds the acceptable cut-offs. The CFI and TLI values of the equal loadings and thresholds model show an acceptable model fit, while the RMSEA and SRMR values are considerably above the cut-off. Comparisons of results across countries and territories on this scale



are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

For U3, the change between equal loadings and baseline models is within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.287 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PRACTR. The loadings for all of the items are high with the exception of item SS2G40F, which shows a moderate loading. Results by participating country/territory show a low loading for item SS2G40F in Chile (ISCED level 02), Japan (ISCED level 02) and Türkiye (ISCED level 02), as well as for item SS2G40A in Germany (ISCED level 02) and New Zealand (U3).

**Table 11.284. Items and response categories used in the construction of scale S2PRACTR**

| Scale or item | Question or item wording                                                                          |
|---------------|---------------------------------------------------------------------------------------------------|
| S2PRACTR      | Thinking about your work with the <target group> on that day, how often did you do the following? |
|               | Recoded response categories for scaling: 1=Never; 2=Rarely; 3=Occasionally; 4=Often; 5=Always     |
|               | Scale mid-point: 3                                                                                |
| SS2G40A       | I explained how a new activity relates to children's lives.                                       |
| SS2G40B       | I gave different activities to suit different children's interests.                               |
| SS2G40C       | I gave different activities to suit different children's levels of development.                   |
| SS2G40E       | I recognised children's individual interests regardless of gender.                                |
| SS2G40F       | I adapted my activities to meet the needs of <dual/second language learners>.                     |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.285. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2PRACTR**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |       |              |       |
| Chile                           | 0.865            | 0.998         | 0.995 | 0.070        | 0.019 |
| Colombia                        | 0.898            | 1.000         | 1.000 | 0.005        | 0.015 |
| Denmark                         | 0.795            | 0.993         | 0.987 | 0.058        | 0.020 |
| Finland                         | 0.803            | 0.985         | 0.971 | 0.079        | 0.027 |
| Flemish Community (Belgium)     | 0.821            | 0.973         | 0.947 | <b>0.131</b> | 0.032 |
| Germany                         | 0.767            | 0.977         | 0.954 | <b>0.117</b> | 0.034 |
| Ireland                         | 0.870            | 0.995         | 0.990 | 0.049        | 0.018 |
| Israel                          | 0.904            | 0.999         | 0.997 | 0.061        | 0.015 |
| Japan                           | 0.837            | 0.998         | 0.997 | 0.055        | 0.021 |
| Morocco                         | 0.879            | 0.987         | 0.974 | <b>0.136</b> | 0.032 |
| Norway                          | 0.825            | 0.986         | 0.971 | <b>0.103</b> | 0.025 |
| New Zealand                     | 0.898            | 0.981         | 0.963 | <b>0.125</b> | 0.027 |
| Spain                           | 0.847            | 0.986         | 0.973 | 0.075        | 0.026 |
| Sweden                          | 0.831            | 0.985         | 0.970 | 0.080        | 0.025 |
| Türkiye                         | 0.828            | 0.980         | 0.960 | <b>0.106</b> | 0.027 |

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| International pooled data       | 0.845            | 0.996         | 0.992 | 0.046        | 0.015 |
| <b>U3</b>                       |                  |               |       |              |       |
| Canada                          | 0.827            | 0.994         | 0.988 | <b>0.158</b> | 0.044 |
| Flemish Community (Belgium)     | 0.855            | 0.985         | 0.971 | <b>0.147</b> | 0.043 |
| Germany                         | 0.790            | 0.981         | 0.962 | <b>0.115</b> | 0.038 |
| Ireland                         | 0.871            | 0.989         | 0.978 | <b>0.108</b> | 0.032 |
| Israel                          | 0.887            | 0.998         | 0.995 | 0.050        | 0.022 |
| Norway                          | 0.841            | 0.992         | 0.984 | 0.097        | 0.029 |
| New Zealand                     | 0.811            | 0.981         | 0.963 | <b>0.125</b> | 0.027 |
| International pooled data       | 0.857            | 0.989         | 0.978 | <b>0.104</b> | 0.031 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.286. Measurement invariance results from MGCFA for scale S2PRACTR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.992     | 0.984 | 0.086 | 0.024 | -                       | -      | -       | -      |
| Equal loadings                | 0.988     | 0.986 | 0.080 | 0.042 | -0.004                  | 0.002  | -0.006  | 0.017  |
| Equal loadings and thresholds | 0.902     | 0.955 | 0.143 | 0.187 | -0.086                  | -0.031 | 0.063   | 0.145  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.992     | 0.984 | 0.109 | 0.035 | -                       | -      | -       | -      |
| Equal loadings                | 0.989     | 0.987 | 0.099 | 0.051 | -0.003                  | 0.003  | -0.011  | 0.015  |
| Equal loadings and thresholds | 0.969     | 0.984 | 0.107 | 0.130 | -0.020                  | -0.002 | 0.008   | 0.079  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.287. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PRACTR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SS2G40A | 0.643   | -1.312      | -0.805      | -0.045      | 0.867       |
| SS2G40B | 0.907   | -1.834      | -1.467      | -0.612      | 0.578       |
| SS2G40C | 0.891   | -1.887      | -1.525      | -0.737      | 0.426       |
| SS2G40E | 0.695   | -1.810      | -1.524      | -0.899      | 0.161       |
| SS2G40F | 0.476   | -0.573      | -0.256      | 0.200       | 0.905       |

Source: OECD, TALIS Starting Strong 2024 database.

### Facilitating language development (S2PRLANR)

The scale *Facilitating language development* (S2PRLANR) was constructed using five items (SS2G39A, SS2G39B, SS2G39C, SS2G39D and SS2G39F). In these set of items, ECEC staff were asked how frequently they engaged in various activities with the target group on a given day. Response options included: “Never”, “Rarely”, “Occasionally”, “Often” and “Always”. Higher scores on this scale reflect more

frequent daily activities aimed at facilitating language development among children. Table 11.288 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.289. The scale S2PRLANR has a high reliability that is above 0.79 in all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI, TLI and SRMR show a good fit across all countries/territories while the RMSEA is within the acceptable range for four ISCED level 02 countries/territories and one U3 country/territory.

Table 11.290 presents the results from the measurement invariance testing for S2PRLANR for both levels. The baseline model fit indices are at least acceptable for both levels except for the RMSEA which is close to the acceptable range. For ISCED level 02, the degree of change between the baseline and equal loadings models is within the cut-off criteria for all fit indices. The change between the equal loadings and equal loadings and thresholds models is close to the acceptable range for the TLI and RMSEA and exceeds the cut-offs for the CFI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

For U3, the change between equal loadings and baseline models is within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA and close to the cut-off for the CFI. No special caution is required when comparing scale score results across countries/territories.

Table 11.291 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PRLANR. The loadings for all of the items are high for the pooled model as well as in single countries/territories.

**Table 11.288. Items and response categories used in the construction of scale S2PRLANR**

| Scale or item | Question or item wording                                                                          |
|---------------|---------------------------------------------------------------------------------------------------|
| S2PRLANR      | Thinking about your work with the <target group> on that day, how often did you do the following? |
|               | Recoded response categories for scaling: 1=Never; 2=Rarely; 3=Occasionally; 4=Often; 5=Always     |
|               | Scale mid-point: 3                                                                                |
| SS2G39A       | I encouraged children to lead conversations.                                                      |
| SS2G39B       | I asked supportive questions to encourage children to give longer explanations.                   |
| SS2G39C       | I supported children to express their ideas by asking them questions.                             |
| SS2G39D       | I rephrased or repeated statements to make sure I understood the children.                        |
| SS2G39F       | I used words or phrasing that was new to children.                                                |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.289. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2PRLANR**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |       |              |       |
| Chile                           | 0.913            | 0.983         | 0.967 | <b>0.112</b> | 0.024 |
| Colombia                        | 0.929            | 0.987         | 0.974 | <b>0.104</b> | 0.020 |
| Denmark                         | 0.896            | 0.996         | 0.991 | 0.074        | 0.016 |
| Finland                         | 0.824            | 0.981         | 0.961 | <b>0.115</b> | 0.032 |
| Flemish Community (Belgium)     | 0.866            | 0.982         | 0.965 | <b>0.124</b> | 0.027 |
| Germany                         | 0.791            | 0.965         | 0.931 | <b>0.124</b> | 0.039 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Ireland                         | 0.902                           | 0.984         | 0.968 | 0.098        | 0.029 |
| Israel                          | 0.931                           | 0.988         | 0.975 | <b>0.181</b> | 0.025 |
| Japan                           | 0.902                           | 0.984         | 0.967 | <b>0.138</b> | 0.025 |
| Morocco                         | 0.883                           | 0.987         | 0.974 | <b>0.112</b> | 0.024 |
| Norway                          | 0.856                           | 0.970         | 0.940 | <b>0.175</b> | 0.039 |
| New Zealand                     | 0.921                           | 0.979         | 0.958 | <b>0.156</b> | 0.051 |
| Spain                           | 0.919                           | 0.996         | 0.993 | 0.048        | 0.013 |
| Sweden                          | 0.875                           | 0.978         | 0.955 | <b>0.130</b> | 0.028 |
| Türkiye                         | 0.912                           | 0.990         | 0.980 | <b>0.112</b> | 0.020 |
| International pooled data       | 0.903                           | 0.986         | 0.972 | 0.086        | 0.018 |
| <b>U3</b>                       |                                 |               |       |              |       |
| Canada                          | 0.904                           | 0.979         | 0.958 | <b>0.200</b> | 0.041 |
| Flemish Community (Belgium)     | 0.879                           | 0.993         | 0.985 | 0.098        | 0.025 |
| Germany                         | 0.823                           | 0.980         | 0.960 | <b>0.113</b> | 0.026 |
| Ireland                         | 0.898                           | 0.990         | 0.980 | <b>0.111</b> | 0.022 |
| Israel                          | 0.938                           | 0.994         | 0.987 | <b>0.127</b> | 0.019 |
| Norway                          | 0.844                           | 0.980         | 0.960 | <b>0.130</b> | 0.029 |
| New Zealand                     | 0.902                           | 0.979         | 0.958 | <b>0.156</b> | 0.051 |
| International pooled data       | 0.903                           | 0.989         | 0.977 | <b>0.116</b> | 0.022 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.290. Measurement invariance results from MGCFA for scale S2PRLANR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.987     | 0.975 | 0.110 | 0.026 | -                       | -      | -       | -      |
| Equal loadings                | 0.985     | 0.983 | 0.091 | 0.035 | -0.002                  | 0.008  | -0.019  | 0.009  |
| Equal loadings and thresholds | 0.940     | 0.972 | 0.116 | 0.148 | -0.045                  | -0.011 | 0.025   | 0.113  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.990     | 0.980 | 0.129 | 0.027 | -                       | -      | -       | -      |
| Equal loadings                | 0.991     | 0.990 | 0.093 | 0.038 | 0.001                   | 0.010  | -0.036  | 0.011  |
| Equal loadings and thresholds | 0.979     | 0.989 | 0.093 | 0.106 | -0.012                  | -0.000 | 0.000   | 0.068  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.291. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PRLANR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SS2G39A | 0.783   | -1.802      | -1.383      | -0.550      | 0.494       |
| SS2G39B | 0.863   | -1.901      | -1.487      | -0.744      | 0.427       |

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SS2G39C | 0.894   | -2.175      | -1.884      | -1.073      | 0.175       |
| SS2G39D | 0.793   | -2.156      | -1.788      | -0.924      | 0.237       |
| SS2G39F | 0.709   | -1.800      | -1.119      | -0.160      | 0.734       |

Source: OECD, TALIS Starting Strong 2024 database.

### Facilitating literacy development (S2PROLIR)

The scale *Facilitating literacy development* (S2PROLIR) was developed based on seven items (SS2G29A, SS2G29B, SS2G29D, SS2G29E, SS2G29F, SS2G29G and SS2G29H). These items focused on how frequently ECEC staff engaged in various activities with children during the most recent week. Response options included: “Not at all”, “Once a week”, “A few times a week”, “Once a day” and “More than once a day”. Higher scores on this scale reflect more frequent activities aimed at facilitating literacy development among children. Table 11.292 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.293. The scale S2PROLIR has a high reliability that is above 0.78 in all participating countries/territories in both populations. Based on the single CFA model fit results, the scale S2PROLIR works well across all populations except in Germany (ISCED level 02 and U3) and Finland (U3), where the CFI, TLI and RMSEA do not meet the acceptable cut-off criteria.

Table 11.294 presents the results from the measurement invariance testing for S2PROLIR for both levels. The baseline model fit indices are at least acceptable for both levels, however the RMSEA is close to being acceptable in the U3 population. For ISCED level 02, the degree of change between the baseline and equal loadings models is within the cut-off criteria for the CFI, RMSEA, SRMR and slightly exceeds the cut-off for the TLI. The change between the equal loadings and equal loadings and thresholds models exceeds the cut-off criteria. The equal loadings and thresholds model shows a poor model fit. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

For U3, the change between equal loadings and baseline models is within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within, or close to, the acceptable range for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.295 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PROLIR. The loadings for all of the items are high with the exception of item SS2G29B, which shows a moderate loading. Results by participating country/territory show a low loading for item SS2G29H in New Zealand (U3).

**Table 11.292. Items and response categories used in the construction of scale S2PROLIR**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                    |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2PROLIR      | How often did you do the following at this <ECEC setting>, during your most recent complete calendar week?<br><i>Recoded response categories for scaling: 1=Not at all; 2=Once a week; 3=A few times a week; 4=Once a day; 5=More than once a day</i><br>Scale mid-point: 3 |
| SS2G29A       | Played word games with the children                                                                                                                                                                                                                                         |
| SS2G29B       | Read books to children                                                                                                                                                                                                                                                      |
| SS2G29D       | Encouraged pre-verbal children to point to pictures when looking at a book                                                                                                                                                                                                  |
| SS2G29E       | Sang songs with or to the children                                                                                                                                                                                                                                          |

| Scale or item | Question or item wording                                                                           |
|---------------|----------------------------------------------------------------------------------------------------|
| SS2G29F       | Engaged children in activities that helped them pick out sounds in words (e.g. phonics games)      |
| SS2G29G       | Used synonyms for words to help explain their meaning when talking with children                   |
| SS2G29H       | Used activities for children to make marks (e.g. finger painting, pressing into <dough/playdough>) |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.293. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2PROLIR**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                  |               |       |       |       |
| Chile                           | 0.886            | 0.954         | 0.931 | 0.118 | 0.045 |
| Colombia                        | 0.941            | 0.983         | 0.974 | 0.075 | 0.024 |
| Denmark                         | 0.824            | 0.970         | 0.955 | 0.079 | 0.033 |
| Finland                         | 0.780            | 0.855         | 0.782 | 0.127 | 0.060 |
| Flemish Community (Belgium)     | 0.859            | 0.968         | 0.952 | 0.089 | 0.033 |
| Germany                         | 0.806            | 0.840         | 0.760 | 0.186 | 0.079 |
| Ireland                         | 0.850            | 0.925         | 0.887 | 0.108 | 0.060 |
| Israel                          | 0.912            | 0.987         | 0.981 | 0.085 | 0.022 |
| Japan                           | 0.817            | 0.959         | 0.938 | 0.074 | 0.038 |
| Morocco                         | 0.873            | 0.977         | 0.965 | 0.083 | 0.028 |
| Norway                          | 0.825            | 0.969         | 0.954 | 0.078 | 0.037 |
| New Zealand                     | 0.897            | 0.992         | 0.984 | 0.105 | 0.023 |
| Spain                           | 0.892            | 0.981         | 0.972 | 0.057 | 0.023 |
| Sweden                          | 0.834            | 0.935         | 0.902 | 0.111 | 0.046 |
| Türkiye                         | 0.874            | 0.979         | 0.969 | 0.075 | 0.027 |
| International pooled data       | 0.868            | 0.955         | 0.933 | 0.082 | 0.034 |
| U3                              |                  |               |       |       |       |
| Canada                          | 0.863            | 0.919         | 0.878 | 0.119 | 0.055 |
| Flemish Community (Belgium)     | 0.849            | 0.946         | 0.918 | 0.111 | 0.055 |
| Germany                         | 0.821            | 0.873         | 0.810 | 0.190 | 0.083 |
| Ireland                         | 0.867            | 0.916         | 0.874 | 0.143 | 0.079 |
| Israel                          | 0.916            | 0.982         | 0.974 | 0.084 | 0.031 |
| Norway                          | 0.821            | 0.917         | 0.875 | 0.129 | 0.065 |
| New Zealand                     | 0.863            | 0.992         | 0.984 | 0.105 | 0.023 |
| International pooled data       | 0.859            | 0.934         | 0.900 | 0.120 | 0.057 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.294. Measurement invariance results from MGCFA for scale S2PROLIR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.959     | 0.939 | 0.097 | 0.040 | -                       | -      | -       | -      |
| Equal loadings                | 0.956     | 0.953 | 0.086 | 0.048 | -0.004                  | 0.013  | -0.011  | 0.009  |
| Equal loadings and thresholds | 0.751     | 0.863 | 0.146 | 0.193 | -0.205                  | -0.090 | 0.060   | 0.145  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.939     | 0.909 | 0.133 | 0.062 | -                       | -      | -       | -      |
| Equal loadings                | 0.940     | 0.934 | 0.113 | 0.068 | 0.001                   | 0.025  | -0.020  | 0.006  |
| Equal loadings and thresholds | 0.876     | 0.927 | 0.119 | 0.158 | -0.065                  | -0.007 | 0.006   | 0.091  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.295. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PROLIR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SS2G29A | 0.671   | -1.122      | -0.568      | 0.228       | 0.743       |
| SS2G29B | 0.598   | -1.659      | -1.075      | -0.204      | 0.685       |
| SS2G29D | 0.696   | -0.754      | -0.522      | 0.059       | 0.533       |
| SS2G29E | 0.709   | -1.741      | -1.313      | -0.590      | -0.069      |
| SS2G29F | 0.828   | -0.846      | -0.433      | 0.209       | 0.684       |
| SS2G29G | 0.697   | -1.239      | -0.797      | -0.031      | 0.373       |
| SS2G29H | 0.698   | -1.032      | -0.546      | 0.171       | 0.603       |

Source: OECD, TALIS Starting Strong 2024 database.

### Facilitating numeracy development (S2PRONUR)

The scale *Facilitating numeracy development* (S2PRONUR) was constructed using five items (SS2G30A, SS2G30B, SS2G30C, SS2G30D and SS2G30F) that assessed how frequently ECEC staff engaged various activities with children at the ECEC setting during the most recent week. Response options included: “Not at all”, “Once a week”, “A few times a week”, “Once a day” and “More than once a day”. Higher values on this scale indicate more frequent engagement in activities that support children’s numeracy development. Table 11.296 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.297. The scale S2PRONUR has a high reliability that is above 0.76 in all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories for the CFI and SRMR. The TLI falls below the acceptable threshold in Norway (U3). The RMSEA is within the acceptable range in nine ISCED level 02 and five U3 countries/territories.

Table 11.298 presents the results from the measurement invariance testing for S2PRONUR. The baseline model fit indices are at least acceptable for both levels. For ISCED level 02, the degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The change between the equal loadings and the equal loadings and thresholds models exceeds the thresholds. The model fit of the equal loadings and thresholds model shows acceptable CFI and TLI. Comparisons of results across

countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

For U3, the change between the equal loadings and the baseline models is within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria. The model fit of the equal loadings and thresholds model shows acceptable CFI and TLI, while the RMSEA and SRMR values considerably exceed the cut-off. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

Table 11.299 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PRONUR. The loadings for all of the items are high for the pooled model as well as in single countries/territories.

**Table 11.296. Items and response categories used in the construction of scale S2PRONUR**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                    |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2PRONUR      | How often did you do the following at this <ECEC setting>, during your most recent complete calendar week?<br><i>Recoded response categories for scaling: 1=Not at all; 2=Once a week; 3=A few times a week; 4=Once a day; 5=More than once a day</i><br>Scale mid-point: 3 |
| SS2G30A       | Used sorting activities by shape or colour                                                                                                                                                                                                                                  |
| SS2G30B       | Played number games                                                                                                                                                                                                                                                         |
| SS2G30C       | Sang songs with numbers                                                                                                                                                                                                                                                     |
| SS2G30D       | Helped children to use numbers or to count                                                                                                                                                                                                                                  |
| SS2G30F       | Encouraged children to measure items (e.g. while cooking or building with blocks)                                                                                                                                                                                           |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.297. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2PRONUR**

| Participating country/territory | Reliability<br>Cronbach's<br>alpha | CFA model fit |       |              |       |
|---------------------------------|------------------------------------|---------------|-------|--------------|-------|
|                                 |                                    | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 02                  |                                    |               |       |              |       |
| Chile                           | 0.893                              | 0.986         | 0.972 | <b>0.111</b> | 0.027 |
| Colombia                        | 0.882                              | 0.970         | 0.940 | <b>0.168</b> | 0.056 |
| Denmark                         | 0.828                              | 1.000         | 0.999 | 0.011        | 0.009 |
| Finland                         | 0.770                              | 0.983         | 0.966 | 0.058        | 0.022 |
| Flemish Community (Belgium)     | 0.816                              | 0.972         | 0.945 | <b>0.117</b> | 0.031 |
| Germany                         | 0.761                              | 0.978         | 0.956 | 0.077        | 0.026 |
| Ireland                         | 0.888                              | 0.986         | 0.973 | <b>0.103</b> | 0.026 |
| Israel                          | 0.917                              | 0.993         | 0.987 | <b>0.104</b> | 0.019 |
| Japan                           | 0.854                              | 0.983         | 0.967 | 0.088        | 0.024 |
| Morocco                         | 0.872                              | 0.983         | 0.966 | <b>0.134</b> | 0.021 |
| Norway                          | 0.790                              | 0.991         | 0.982 | 0.053        | 0.020 |
| New Zealand                     | 0.897                              | 0.995         | 0.986 | <b>0.134</b> | 0.031 |
| Spain                           | 0.911                              | 0.996         | 0.991 | 0.064        | 0.013 |
| Sweden                          | 0.821                              | 0.990         | 0.981 | 0.061        | 0.019 |
| Türkiye                         | 0.904                              | 0.995         | 0.989 | 0.081        | 0.015 |
| International pooled data       | 0.880                              | 0.994         | 0.988 | 0.051        | 0.020 |



| Participating country/territory | Reliability<br>Cronbach's<br>alpha | CFA model fit |              |              |       |
|---------------------------------|------------------------------------|---------------|--------------|--------------|-------|
|                                 |                                    | CFI           | TLI          | RMSEA        | SRMR  |
| U3                              |                                    |               |              |              |       |
| Canada                          | 0.891                              | 0.990         | 0.980        | 0.086        | 0.020 |
| Flemish Community (Belgium)     | 0.835                              | 0.991         | 0.982        | 0.057        | 0.025 |
| Germany                         | 0.808                              | 0.994         | 0.987        | 0.047        | 0.015 |
| Ireland                         | 0.851                              | 0.978         | 0.956        | <b>0.112</b> | 0.027 |
| Israel                          | 0.922                              | 0.995         | 0.990        | 0.081        | 0.012 |
| Norway                          | 0.799                              | 0.943         | <b>0.886</b> | <b>0.138</b> | 0.047 |
| New Zealand                     | 0.894                              | 0.995         | 0.986        | <b>0.134</b> | 0.031 |
| International pooled data       | 0.881                              | 0.991         | 0.981        | 0.071        | 0.018 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.298. Measurement invariance results from MGCFA for scale S2PRONUR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.991     | 0.981 | 0.086 | 0.024 | -                       | -      | -       | -      |
| Equal loadings                | 0.987     | 0.985 | 0.078 | 0.036 | -0.004                  | 0.003  | -0.008  | 0.012  |
| Equal loadings and thresholds | 0.915     | 0.961 | 0.124 | 0.158 | -0.071                  | -0.024 | 0.046   | 0.122  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.991     | 0.982 | 0.083 | 0.024 | -                       | -      | -       | -      |
| Equal loadings                | 0.987     | 0.984 | 0.079 | 0.035 | -0.004                  | 0.002  | -0.004  | 0.011  |
| Equal loadings and thresholds | 0.902     | 0.951 | 0.138 | 0.164 | -0.085                  | -0.033 | 0.060   | 0.129  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.299. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PRONUR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SS2G30A | 0.780   | -0.860      | -0.345      | 0.500       | 0.998       |
| SS2G30B | 0.859   | -0.882      | -0.401      | 0.418       | 0.987       |
| SS2G30C | 0.781   | -0.506      | -0.125      | 0.505       | 1.094       |
| SS2G30D | 0.742   | -1.473      | -0.993      | -0.120      | 0.414       |
| SS2G30F | 0.695   | -0.602      | -0.162      | 0.536       | 0.968       |

Source: OECD, TALIS Starting Strong 2024 database.

### **Behavioural support in the classroom/playroom (S2SOCIALR)**

ECEC staff answered five items measuring their *Behavioural support in the classroom/playroom* (S2SOCIALR). These were items SS2G41A, SS2G41B, SS2G41C, SS2G41D and SS2G41F, for which ECEC staff were asked how often they engaged in various activities with the target group on a given day. The available response options were: “Never”, “Rarely”, “Occasionally”, “Often” and “Always”. Higher scores on this scale reflect a greater level of behavioural support provided in the classroom/playroom. Table 11.300 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.301. The scale S2SOCIALR has a high reliability that is above 0.80 in all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. Only in Morocco ISCED level 02 does the RMSEA exceed the acceptable threshold.

Table 11.302 presents the results from the measurement invariance testing for S2SOCIALR for both levels. The baseline model fit indices are at least acceptable for both levels. For ISCED level 02, the degree of change between the baseline and the equal loadings models is within the cut-off criteria for the TLI, RMSEA, SRMR and slightly exceeds the cut-off for the CFI. The change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

For U3, the change between the equal loadings and baseline models is within the acceptable range for the RMSEA and SRMR and is close to the cut-off for the CFI and TLI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.303 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2SOCIALR. The loadings for all of the items are high for the pooled model as well as in single countries/territories.

**Table 11.300. Items and response categories used in the construction of scale S2SOCIALR**

| Scale or item | Question or item wording                                                                             |
|---------------|------------------------------------------------------------------------------------------------------|
| S2SOCIALR     | Thinking about your work with the <target group> on that day, how often did you do the following?    |
|               | <i>Recoded response categories for scaling: 1=Never; 2=Rarely; 3=Occasionally; 4=Often; 5=Always</i> |
|               | Scale mid-point: 3                                                                                   |
| SS2G41A       | I explained the rules children should follow at the start of a new activity.                         |
| SS2G41B       | I addressed children's disruptive behaviour by explaining why they should stop.                      |
| SS2G41C       | I showed appreciation to children that behaved well during an activity.                              |
| SS2G41D       | I helped children understand the consequences if they did not follow the rules.                      |
| SS2G41F       | I redirected a child to an appropriate activity if they were disturbing other children.              |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.301. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2SOCIALR**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                  |               |       |       |       |
| Chile                           | 0.870            | 0.983         | 0.966 | 0.088 | 0.029 |
| Colombia                        | 0.904            | 0.991         | 0.981 | 0.054 | 0.023 |
| Denmark                         | 0.833            | 0.994         | 0.987 | 0.060 | 0.016 |
| Finland                         | 0.865            | 0.998         | 0.995 | 0.040 | 0.010 |
| Flemish Community (Belgium)     | 0.851            | 0.993         | 0.986 | 0.063 | 0.021 |
| Germany                         | 0.853            | 0.984         | 0.968 | 0.095 | 0.020 |
| Ireland                         | 0.902            | 1.000         | 1.002 | 0.000 | 0.008 |
| Israel                          | 0.918            | 0.993         | 0.985 | 0.084 | 0.015 |
| Japan                           | 0.927            | 0.995         | 0.989 | 0.088 | 0.015 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Morocco                         | 0.865                           | 0.972         | 0.944 | <b>0.120</b> | 0.031 |
| Norway                          | 0.838                           | 0.993         | 0.986 | 0.069        | 0.018 |
| New Zealand                     | 0.873                           | 0.984         | 0.968 | 0.087        | 0.036 |
| Spain                           | 0.897                           | 0.994         | 0.988 | 0.049        | 0.014 |
| Sweden                          | 0.854                           | 0.996         | 0.993 | 0.052        | 0.015 |
| Türkiye                         | 0.888                           | 0.995         | 0.990 | 0.057        | 0.013 |
| International pooled data       | 0.879                           | 0.994         | 0.989 | 0.039        | 0.011 |
| <b>U3</b>                       |                                 |               |       |              |       |
| Canada                          | 0.876                           | 0.990         | 0.979 | 0.086        | 0.029 |
| Flemish Community (Belgium)     | 0.891                           | 1.000         | 1.002 | 0.000        | 0.007 |
| Germany                         | 0.809                           | 1.000         | 1.000 | 0.004        | 0.008 |
| Ireland                         | 0.900                           | 0.992         | 0.983 | 0.079        | 0.022 |
| Israel                          | 0.919                           | 0.991         | 0.982 | 0.095        | 0.022 |
| Norway                          | 0.846                           | 0.994         | 0.989 | 0.055        | 0.018 |
| New Zealand                     | 0.881                           | 0.984         | 0.968 | 0.087        | 0.036 |
| International pooled data       | 0.885                           | 0.996         | 0.992 | 0.048        | 0.012 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.302. Measurement invariance results from MGCFA for scale S2SOCIALR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.993     | 0.986 | 0.068 | 0.018 | -                       | -      | -       | -      |
| Equal loadings                | 0.986     | 0.984 | 0.072 | 0.029 | -0.007                  | -0.002 | 0.004   | 0.012  |
| Equal loadings and thresholds | 0.961     | 0.982 | 0.077 | 0.108 | -0.026                  | -0.002 | 0.005   | 0.078  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.994     | 0.989 | 0.065 | 0.017 | -                       | -      | -       | -      |
| Equal loadings                | 0.987     | 0.984 | 0.079 | 0.030 | -0.008                  | -0.005 | 0.013   | 0.013  |
| Equal loadings and thresholds | 0.966     | 0.983 | 0.081 | 0.104 | -0.021                  | -0.001 | 0.003   | 0.074  |

Note: The Flemish Community (Belgium) and New Zealand are excluded from measurement invariance testing in the ISCED level 02 population; New Zealand is excluded from measurement invariance testing in the U3 population.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.303. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2SOCIALR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SS2G41A | 0.748   | -1.955      | -1.708      | -1.139      | -0.257      |
| SS2G41B | 0.808   | -1.934      | -1.618      | -0.943      | 0.083       |
| SS2G41C | 0.768   | -2.078      | -1.845      | -1.171      | -0.118      |
| SS2G41D | 0.869   | -1.907      | -1.522      | -0.844      | 0.154       |
| SS2G41F | 0.678   | -1.683      | -1.245      | -0.470      | 0.457       |

Source: OECD, TALIS Starting Strong 2024 database.

### Promoting awareness and acceptance of diversity (S2PAAD)

The scale *Promoting awareness and acceptance of diversity* (S2PAAD) was constructed using five items (SS2G23A, SS2G23C, SS2G23D, SS2G23E and SS2G23G) that assessed the degree to which various statements related to diversity were applicable to the ECEC setting. Response options included: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher scores on this scale indicate a stronger emphasis on promotion awareness and acceptance of diversity. Table 11.304 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.305. The scale S2PAAD has a high reliability that is above 0.74 in all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI, TLI and SRMR show an acceptable model fit across all countries/territories while the RMSEA is at least acceptable in 8 of the ISCED level 02 and 5 of the U3 countries/territories.

Table 11.306 presents the results from the measurement invariance testing for S2PAAD for both levels. The baseline model fit indices are at least acceptable for both levels with the exception of the RMSEA that is close to the acceptable range. For ISCED level 02, the degree of change between the baseline and the equal loadings model is within the cut-off criteria for the RMSEA and SRMR and close to the cut-off for the CFI and TLI. The change between the equal loadings and equal loadings and thresholds models exceeds the thresholds. However, the CFI and TLI of the equal loadings and threshold model are acceptable and the RMSEA and SRMR are close to being acceptable. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

For U3, the change between the equal loadings and baseline models is within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is close to the acceptable range for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.307 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PAAD. The loadings for all of the items are high with the exception of item SS2G23G which shows a moderate loading. Results by participating country/territory show a low loading for items SS2G23G and SS2G23E in Finland (ISCED level 02).

**Table 11.304. Items and response categories used in the construction of scale S2PAAD**

| Scale or item | Question or item wording                                                                                                                    |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| S2PAAD        | When considering daily interactions with children, to what extent do the following apply to this <ECEC setting>?                            |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i>                                      |
|               | Scale mid-point: 2.5                                                                                                                        |
| SS2G23A       | Books and pictures feature people from a variety of ethnic and cultural groups.                                                             |
| SS2G23C       | Books and pictures feature people with different physical needs.                                                                            |
| SS2G23D       | Books and pictures feature diverse family structures (e.g. single parent families, families with parents from sexual or gender minorities). |
| SS2G23E       | Children play with toys and artefacts from cultures other than the ethnic majority.                                                         |
| SS2G23G       | Activities aim to raise awareness about the different languages of the <dual/second language learners> in the <classroom/playgroup/group>.  |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.305. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2PAAD**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |       |              |       |
| Chile                           | 0.843            | 0.984         | 0.967 | 0.092        | 0.026 |
| Colombia                        | 0.876            | 0.966         | 0.932 | 0.100        | 0.039 |
| Denmark                         | 0.817            | 0.953         | 0.905 | <b>0.144</b> | 0.038 |
| Finland                         | 0.741            | 0.993         | 0.986 | 0.041        | 0.019 |
| Flemish Community (Belgium)     | 0.837            | 0.978         | 0.957 | <b>0.125</b> | 0.035 |
| Germany                         | 0.810            | 0.979         | 0.958 | 0.094        | 0.028 |
| Ireland                         | 0.924            | 0.997         | 0.994 | 0.065        | 0.014 |
| Israel                          | 0.891            | 0.974         | 0.949 | <b>0.152</b> | 0.039 |
| Japan                           | 0.849            | 0.975         | 0.949 | 0.099        | 0.035 |
| Morocco                         | 0.819            | 0.972         | 0.944 | <b>0.111</b> | 0.033 |
| Norway                          | 0.841            | 0.975         | 0.950 | <b>0.118</b> | 0.038 |
| New Zealand                     | 0.863            | 1.000         | 1.005 | 0.000        | 0.016 |
| Spain                           | 0.863            | 0.985         | 0.971 | 0.090        | 0.028 |
| Sweden                          | 0.850            | 0.981         | 0.961 | <b>0.135</b> | 0.044 |
| Türkiye                         | 0.868            | 0.976         | 0.952 | <b>0.129</b> | 0.035 |
| International pooled data       | 0.854            | 0.985         | 0.970 | 0.075        | 0.025 |
| U3                              |                  |               |       |              |       |
| Canada                          | 0.893            | 0.989         | 0.979 | 0.097        | 0.023 |
| Flemish Community (Belgium)     | 0.843            | 0.975         | 0.950 | <b>0.115</b> | 0.036 |
| Germany                         | 0.800            | 0.958         | 0.917 | <b>0.129</b> | 0.040 |
| Ireland                         | 0.923            | 0.988         | 0.977 | <b>0.135</b> | 0.026 |
| Israel                          | 0.910            | 0.992         | 0.984 | 0.083        | 0.019 |
| Norway                          | 0.826            | 0.989         | 0.977 | 0.072        | 0.030 |
| New Zealand                     | 0.868            | 1.000         | 1.005 | 0.000        | 0.016 |
| International pooled data       | 0.884            | 0.989         | 0.977 | 0.090        | 0.022 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.306. Measurement invariance results from MGCFA for scale S2PAAD with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.980     | 0.961 | 0.107 | 0.032 | -                       | -      | -       | -      |
| Equal loadings                | 0.973     | 0.969 | 0.095 | 0.045 | -0.007                  | 0.009  | -0.012  | 0.013  |
| Equal loadings and thresholds | 0.909     | 0.947 | 0.124 | 0.134 | -0.064                  | -0.022 | 0.030   | 0.089  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.988     | 0.975 | 0.105 | 0.029 | -                       | -      | -       | -      |
| Equal loadings                | 0.988     | 0.985 | 0.081 | 0.037 | 0.000                   | 0.010  | -0.024  | 0.008  |

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| Equal loadings and thresholds | 0.966     | 0.979 | 0.097 | 0.096 | -0.021                  | -0.006 | 0.016   | 0.060  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.307. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PAAD**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SS2G23A | 0.788   | -1.295      | 0.013       | 1.003       |
| SS2G23C | 0.850   | -0.795      | 0.376       | 1.279       |
| SS2G23D | 0.778   | -0.678      | 0.441       | 1.299       |
| SS2G23E | 0.688   | -0.442      | 0.681       | 1.453       |
| SS2G23G | 0.582   | -0.702      | 0.361       | 1.170       |

Source: OECD, TALIS Starting Strong 2024 database.

### Engagement in collaborative practices (S2COLLR)

Five items were used to assess ECEC staff's *Engagement in collaborative practices* (S2COLLR). In these items (SS2G42A, SS2G42B, SS2G42C, SS2G42D and SS2G42F), ECEC staff had to indicate how often they engaged in various activities at the ECEC setting. The available response options were: "Never", "Less than monthly", "Monthly", "Weekly" and "Daily". Higher values on this scale indicate a greater level of engagement in collaborative practices. Table 11.308 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.309. The scale S2COLLR has a high reliability that is above 0.72 in all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI does not meet the acceptable cut-off in Chile (ISCED level 02), the TLI in Chile and Colombia (ISCED level 02) and the RMSEA in Chile, Colombia, Germany, Israel, Morocco, New Zealand (ISCED level 02), and Israel and New Zealand (U3). Based on the single CFA model fit results, the scale S2COLLR works well across all populations except in Chile (ISCED level 02), where the CFI, TLI and RMSEA do not meet the acceptable cut-off criteria.

Table 11.310 presents the results from the measurement invariance testing for S2COLLR for both levels. The baseline model fit indices are at least acceptable for both levels with the exception of the RMSEA in ISCED level 02 where it is close to the cut-off. For ISCED level 02, the degree of change between the baseline and equal loadings model is within the cut-off criteria for the CFI, RMSEA and SRMR. The change between the equal loadings and the equal loadings and thresholds models exceeds the acceptable cut-offs. The equal loadings and thresholds model shows a poor model fit. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

For U3, the change between the equal loadings and baseline models is within the acceptable range for the TLI, RMSEA and SRMR. The degree of change between the equal loadings and the equal loadings and thresholds models is within, or close to, the acceptable range for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.311 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2COLLR. The loadings for all of the items are high with the exception of item SS2G42A, which shows a moderate loading. Results by participating country/territory show a low loading for item SS2G42B in Finland and Japan (both ISCED level 02).

**Table 11.308. Items and response categories used in the construction of scale S2COLLR**

| Scale or item | Question or item wording                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------|
| S2COLLR       | On average, how often do you engage in the following activities in this <ECEC setting>?                    |
|               | <i>Recoded response categories for scaling: 1=Never; 2=Less than monthly; 3=Monthly; 4=Weekly; 5=Daily</i> |
|               | Scale mid-point: 3                                                                                         |
| SS2G42A       | Provide feedback to other <ECEC staff> about their practice                                                |
| SS2G42B       | Engage in joint activities across different groups, including age groups                                   |
| SS2G42C       | Exchange learning or pedagogical materials with colleagues                                                 |
| SS2G42D       | Co-design activities or content for children's development, well-being and learning with colleagues        |
| SS2G42F       | Discuss the evaluation of children's development, well-being and learning with other <ECEC staff>          |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.309. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2COLLR**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                  |               |       |       |       |
| Chile                           | 0.803            | 0.889         | 0.778 | 0.230 | 0.073 |
| Colombia                        | 0.873            | 0.944         | 0.888 | 0.148 | 0.061 |
| Denmark                         | 0.755            | 0.967         | 0.935 | 0.091 | 0.027 |
| Finland                         | 0.724            | 0.959         | 0.918 | 0.089 | 0.030 |
| Flemish Community (Belgium)     | 0.763            | 0.975         | 0.950 | 0.087 | 0.025 |
| Germany                         | 0.745            | 0.953         | 0.907 | 0.114 | 0.034 |
| Ireland                         | 0.817            | 0.973         | 0.946 | 0.091 | 0.035 |
| Israel                          | 0.859            | 0.982         | 0.964 | 0.123 | 0.034 |
| Japan                           | 0.752            | 0.991         | 0.982 | 0.052 | 0.018 |
| Morocco                         | 0.845            | 0.961         | 0.922 | 0.167 | 0.035 |
| Norway                          | 0.737            | 0.978         | 0.957 | 0.079 | 0.027 |
| New Zealand                     | 0.864            | 0.978         | 0.956 | 0.136 | 0.046 |
| Spain                           | 0.808            | 0.974         | 0.949 | 0.088 | 0.028 |
| Sweden                          | 0.739            | 0.974         | 0.949 | 0.072 | 0.023 |
| Türkiye                         | 0.880            | 0.982         | 0.964 | 0.109 | 0.023 |
| International pooled data       | 0.797            | 0.950         | 0.900 | 0.096 | 0.031 |
| U3                              |                  |               |       |       |       |
| Canada                          | 0.809            | 0.978         | 0.956 | 0.091 | 0.025 |
| Flemish Community (Belgium)     | 0.866            | 0.999         | 0.998 | 0.025 | 0.012 |
| Germany                         | 0.744            | 0.974         | 0.948 | 0.082 | 0.026 |
| Ireland                         | 0.825            | 0.986         | 0.971 | 0.068 | 0.027 |
| Israel                          | 0.858            | 0.978         | 0.957 | 0.120 | 0.035 |
| Norway                          | 0.735            | 0.967         | 0.934 | 0.085 | 0.031 |
| New Zealand                     | 0.789            | 0.978         | 0.956 | 0.136 | 0.046 |
| International pooled data       | 0.814            | 0.980         | 0.960 | 0.078 | 0.021 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.



**Table 11.310. Measurement invariance results from MGCFA for scale S2COLLR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.970     | 0.939 | 0.108 | 0.033 | -                       | -      | -       | -      |
| Equal loadings                | 0.969     | 0.965 | 0.082 | 0.042 | -0.000                  | 0.026  | -0.026  | 0.008  |
| Equal loadings and thresholds | 0.769     | 0.894 | 0.143 | 0.180 | -0.200                  | -0.071 | 0.061   | 0.139  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.982     | 0.964 | 0.090 | 0.024 | -                       | -      | -       | -      |
| Equal loadings                | 0.971     | 0.965 | 0.089 | 0.041 | -0.011                  | 0.001  | -0.002  | 0.016  |
| Equal loadings and thresholds | 0.922     | 0.960 | 0.095 | 0.117 | -0.050                  | -0.005 | 0.006   | 0.077  |

Note: New Zealand and Norway are excluded from measurement invariance testing in the U3 population.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.311. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2COLLR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SS2G42A | 0.594   | -0.976      | -0.395      | 0.028       | 0.899       |
| SS2G42B | 0.577   | -1.183      | -0.532      | -0.003      | 0.793       |
| SS2G42C | 0.719   | -1.344      | -0.639      | -0.096      | 0.762       |
| SS2G42D | 0.803   | -1.549      | -0.987      | -0.419      | 0.632       |
| SS2G42F | 0.621   | -1.626      | -0.984      | -0.360      | 0.594       |

Source: OECD, TALIS Starting Strong 2024 database.

### Facilitating parent/guardian engagement (S2PARENr)

The scale of *Facilitating parent/guardian engagement* (S2PARENr) was measured by a set of five items: SS2G43A, SS2G43C, SS2G43D, SS2G43E and SS2G43F. ECEC staff were asked to indicate their level of agreement with each of these items using the following response categories: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher scores on this scale indicate that ECEC staff agree more strongly that parent/guardian engagement is supported in ECEC setting. Table 11.312 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.313. The scale S2PARENr has a high reliability that is above 0.70 in all participating countries/territories in both populations, except for Denmark ISCED level 02 where it is 0.69. The single country/territory model fit is at least acceptable in most countries/territories. The CFI, TLI and SRMR show a good fit across all countries/territories, except for Germany ISCED level 02 where the TLI is lower than the acceptable cut-off. Further, the RMSEA is at least acceptable in most countries, except for Denmark, Germany, Israel, Morocco, Norway and Türkiye (ISCED level 02), and Canada, the Flemish Community of Belgium, Germany, Ireland and Norway (U3), where it exceeds the cut-off.

Table 11.314 presents the results from the measurement invariance testing for S2PARENr for both levels. The baseline model fit is at least acceptable for both levels based on the CFI, TLI and RMSEA. For ISCED level 02, the degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA, SRMR and slightly exceeds the cut-off for the CFI. The change between the equal loadings and the equal loadings and thresholds models exceeds the cut-offs for all fit indices. The equal loadings and thresholds model shows a poor model fit. Comparisons of results across countries and



territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

For U3, the change between equal loadings and baseline models is within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-offs for all fit indices. However, the model fit of the equal loadings and thresholds model shows acceptable CFI and TLI. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

Table 11.315 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PAREN. The loadings for all the items are high, except for item SS2G43A that exhibits a low loading. Results by participating country/territory also show a low loading for item SS2G43A in eight ISCED level 02 participants (Denmark, Finland, the Flemish Community of Belgium, Germany, Ireland, Japan, Norway and Sweden) and six U3 participants (Canada, the Flemish Community of Belgium, Germany, Ireland, Israel and Norway).

**Table 11.312. Items and response categories used in the construction of scale S2PAREN**

| Scale or item | Question or item wording                                                                                              |
|---------------|-----------------------------------------------------------------------------------------------------------------------|
| S2PAREN       | How strongly do you agree or disagree with these statements as applied to this <ECEC setting>?                        |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i>            |
|               | Scale mid-point: 2.5                                                                                                  |
| SS2G43A       | Parents or guardians are informed about daily activities on a regular basis.                                          |
| SS2G43C       | Parents or guardians are encouraged by <ECEC staff> to participate in regular <classroom/playgroup/group> activities. |
| SS2G43D       | Parents or guardians are encouraged by <ECEC staff> to contribute to <classroom/playgroup/group> level decisions.     |
| SS2G43E       | Parents or guardians are encouraged by <ECEC staff> to take on <ECEC setting> level tasks.                            |
| SS2G43F       | Parents or guardians are given opportunities to actively participate in <ECEC setting> decisions.                     |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.313. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2PAREN**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |              |              |       |
| Chile                           | 0.893            | 0.993         | 0.987        | 0.081        | 0.018 |
| Colombia                        | 0.877            | 0.988         | 0.976        | 0.094        | 0.028 |
| Denmark                         | 0.689            | 0.955         | 0.910        | <b>0.101</b> | 0.037 |
| Finland                         | 0.790            | 0.987         | 0.973        | 0.077        | 0.030 |
| Flemish Community (Belgium)     | 0.750            | 0.977         | 0.953        | 0.089        | 0.033 |
| Germany                         | 0.718            | 0.904         | <b>0.807</b> | <b>0.149</b> | 0.052 |
| Ireland                         | 0.845            | 0.993         | 0.987        | 0.079        | 0.032 |
| Israel                          | 0.876            | 0.970         | 0.939        | <b>0.226</b> | 0.057 |
| Japan                           | 0.795            | 0.993         | 0.986        | 0.079        | 0.026 |
| Morocco                         | 0.856            | 0.967         | 0.934        | <b>0.190</b> | 0.035 |
| Norway                          | 0.716            | 0.957         | 0.914        | <b>0.117</b> | 0.040 |
| New Zealand                     | 0.868            | 0.998         | 0.997        | 0.068        | 0.028 |
| Spain                           | 0.846            | 0.983         | 0.967        | 0.084        | 0.031 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |       |
|---------------------------------|---------------------------------|---------------|--------------|--------------|-------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR  |
| Sweden                          | 0.797                           | 0.988         | 0.975        | 0.082        | 0.027 |
| Türkiye                         | 0.891                           | 0.990         | 0.981        | <b>0.108</b> | 0.024 |
| International pooled data       | 0.817                           | 0.983         | 0.966        | 0.085        | 0.027 |
| <b>U3</b>                       |                                 |               |              |              |       |
| Canada                          | 0.804                           | 0.977         | 0.954        | <b>0.126</b> | 0.042 |
| Flemish Community (Belgium)     | 0.753                           | 0.965         | 0.930        | <b>0.126</b> | 0.046 |
| Germany                         | 0.747                           | 0.958         | 0.916        | <b>0.114</b> | 0.035 |
| Ireland                         | 0.871                           | 0.991         | 0.982        | <b>0.102</b> | 0.029 |
| Israel                          | 0.823                           | 0.984         | 0.969        | 0.099        | 0.061 |
| Norway                          | 0.751                           | 0.937         | <b>0.875</b> | <b>0.149</b> | 0.055 |
| New Zealand                     | 0.840                           | 0.998         | 0.997        | 0.068        | 0.028 |
| International pooled data       | 0.782                           | 0.975         | 0.949        | 0.097        | 0.035 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.314. Measurement invariance results from MGCFA for scale S2PARENr with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.982     | 0.963 | 0.114 | 0.033 | -                       | -      | -       | -      |
| Equal loadings                | 0.970     | 0.966 | 0.110 | 0.055 | -0.012                  | 0.002  | -0.003  | 0.022  |
| Equal loadings and thresholds | 0.868     | 0.922 | 0.166 | 0.208 | -0.103                  | -0.043 | 0.055   | 0.152  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.982     | 0.963 | 0.110 | 0.042 | -                       | -      | -       | -      |
| Equal loadings                | 0.980     | 0.975 | 0.090 | 0.055 | -0.002                  | 0.012  | -0.020  | 0.013  |
| Equal loadings and thresholds | 0.926     | 0.952 | 0.126 | 0.147 | -0.054                  | -0.024 | 0.036   | 0.092  |

Note: New Zealand and Norway are excluded from measurement invariance testing in the U3 population.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.315. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PARENr**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SS2G43A | 0.334   | -2.196      | -1.327      | 0.081       |
| SS2G43C | 0.742   | -1.323      | -0.224      | 0.855       |
| SS2G43D | 0.865   | -1.187      | 0.008       | 1.130       |
| SS2G43E | 0.795   | -1.211      | -0.133      | 1.079       |
| SS2G43F | 0.728   | -1.437      | -0.336      | 1.024       |

Source: OECD, TALIS Starting Strong 2024 database.

### **Satisfaction with setting leadership (S2SSLEAD)**

The scale of *Satisfaction with setting leadership* (S2SSLEAD) was measured by a set of seven items (SS2G44A, SS2G44B, SS2G44C, SS2G44D, SS2G44E, SS2G44F and SS2G44G), in which ECEC staff

were asked to indicate their level of agreement with different statements about the ECEC setting leader. For each item, the following response categories were available: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher scores on this scale reflect greater satisfaction with the leadership at the ECEC setting. Item SS2G44G was reverse coded due to its negative statement about satisfaction with leadership and to ensure it had the same direction as the rest of the items. Table 11.316 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.317. The scale S2SSLEAD has a high reliability that is above 0.900 in most participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI and SRMR show a good fit across all countries/territories. The TLI also shows a good fit across countries/territories, except for the two populations in New Zealand. The RMSEA is at least acceptable in approximately half of the countries/territories in each population. For ISCED level 02, the RMSEA exceeds the cut-off in Colombia, Denmark, the Flemish Community of Belgium, Morocco, New Zealand, Sweden and Türkiye. For U3, the RMSEA exceeds the cut-off in the Flemish Community of Belgium, Ireland and New Zealand.

Table 11.318 presents the results from the measurement invariance testing for S2SSLEAD for both levels. The baseline model fit indices are at least acceptable for both levels. For ISCED level 02, the degree of change between the baseline and equal loadings models is within the cut-off criteria for the TLI, RMSEA, SRMR and slightly exceeds the cut-off for the CFI. The change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI, TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

For U3, the change between the equal loadings and baseline models is within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI, TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.319 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2SSLEAD. The loadings for all of the items are high, except for item SS2G44G that shows a low loading. Results by participating country/territory also show a low loading for item SS2G44G in six ISCED level 02 participants (Chile, Colombia, Israel, Morocco, Sweden and Türkiye) and three U3 participants (Canada, the Flemish Community of Belgium and Israel).

**Table 11.316. Items and response categories used in the construction of scale S2SSLEAD**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                    |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2SSLEAD      | Thinking about the <ECEC setting leader> in this <ECEC setting>, how strongly do you agree or disagree with the following statements?<br><i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i><br>Scale mid-point: 2.5 |
| SS2G44A       | The <ECEC setting leader> has a clear <vision> for this <ECEC setting>.                                                                                                                                                                                                     |
| SS2G44B       | The <ECEC setting leader> encourages co-operation among <ECEC staff> to develop new ideas in their practices.                                                                                                                                                               |
| SS2G44C       | The <ECEC setting leader> encourages <ECEC staff> to take responsibility for improving their practices.                                                                                                                                                                     |
| SS2G44D       | The <ECEC setting leader> encourages all staff to have a say on important decisions.                                                                                                                                                                                        |
| SS2G44E       | The <ECEC setting leader> promotes a culture of shared professional learning.                                                                                                                                                                                               |
| SS2G44F       | The <ECEC setting leader> communicates effectively with <ECEC staff>.                                                                                                                                                                                                       |
| SS2G44G*      | I need more support from my <ECEC setting leader>.                                                                                                                                                                                                                          |

Note: \* Item was reverse coded.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.317. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2SSLEAD**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |              |              |       |
| Chile                           | 0.937            | 0.995         | 0.993        | 0.071        | 0.015 |
| Colombia                        | 0.922            | 0.991         | 0.987        | <b>0.103</b> | 0.027 |
| Denmark                         | 0.932            | 0.988         | 0.982        | <b>0.106</b> | 0.031 |
| Finland                         | 0.934            | 0.991         | 0.986        | 0.090        | 0.025 |
| Flemish Community (Belgium)     | 0.931            | 0.979         | 0.969        | <b>0.136</b> | 0.034 |
| Germany                         | 0.930            | 0.996         | 0.993        | 0.059        | 0.020 |
| Ireland                         | 0.940            | 0.994         | 0.990        | 0.070        | 0.030 |
| Israel                          | 0.928            | 0.999         | 0.998        | 0.060        | 0.017 |
| Japan                           | 0.923            | 0.994         | 0.991        | 0.072        | 0.021 |
| Morocco                         | 0.882            | 0.985         | 0.978        | <b>0.128</b> | 0.025 |
| Norway                          | 0.914            | 0.991         | 0.986        | 0.084        | 0.032 |
| New Zealand                     | 0.949            | 0.966         | <b>0.897</b> | <b>0.224</b> | 0.050 |
| Spain                           | 0.958            | 0.995         | 0.993        | 0.076        | 0.021 |
| Sweden                          | 0.923            | 0.986         | 0.979        | <b>0.116</b> | 0.032 |
| Türkiye                         | 0.946            | 0.996         | 0.994        | <b>0.130</b> | 0.018 |
| International pooled data       | 0.932            | 0.995         | 0.992        | 0.065        | 0.017 |
| U3                              |                  |               |              |              |       |
| Canada                          | 0.936            | 0.996         | 0.994        | 0.076        | 0.023 |
| Flemish Community (Belgium)     | 0.911            | 0.975         | 0.963        | <b>0.121</b> | 0.043 |
| Germany                         | 0.924            | 0.992         | 0.989        | 0.073        | 0.022 |
| Ireland                         | 0.943            | 0.994         | 0.990        | <b>0.102</b> | 0.022 |
| Israel                          | 0.923            | 0.996         | 0.993        | 0.076        | 0.027 |
| Norway                          | 0.930            | 0.999         | 0.999        | 0.030        | 0.019 |
| New Zealand                     | 0.947            | 0.966         | <b>0.897</b> | <b>0.224</b> | 0.050 |
| International pooled data       | 0.929            | 0.995         | 0.993        | 0.059        | 0.018 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.318. Measurement invariance results from MGCFA for scale S2SSLEAD with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.994     | 0.990 | 0.096 | 0.025 | -                       | -      | -       | -      |
| Equal loadings                | 0.988     | 0.987 | 0.110 | 0.066 | -0.006                  | -0.003 | 0.015   | 0.041  |
| Equal loadings and thresholds | 0.987     | 0.991 | 0.091 | 0.113 | -0.001                  | 0.004  | -0.019  | 0.047  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.994     | 0.991 | 0.084 | 0.026 | -                       | -      | -       | -      |
| Equal loadings                | 0.991     | 0.990 | 0.089 | 0.051 | -0.003                  | -0.001 | 0.005   | 0.025  |

| Invariance model              | Model fit |       |       |       | Difference in model fit |              |                |               |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------------|----------------|---------------|
|                               | CFI       | TLI   | RMSEA | SRMR  | $\Delta$ CFI            | $\Delta$ TLI | $\Delta$ RMSEA | $\Delta$ SRMR |
| Equal loadings and thresholds | 0.990     | 0.993 | 0.075 | 0.106 | -0.001                  | 0.003        | -0.014         | 0.055         |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.319. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2SSLEAD**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SS2G44A | 0.863   | -2.058      | -1.229      | 0.104       |
| SS2G44B | 0.931   | -2.070      | -1.256      | 0.155       |
| SS2G44C | 0.891   | -2.144      | -1.312      | 0.191       |
| SS2G44D | 0.857   | -1.923      | -0.977      | 0.278       |
| SS2G44E | 0.894   | -2.003      | -1.089      | 0.329       |
| SS2G44F | 0.874   | -1.855      | -1.003      | 0.220       |
| SS2G44G | 0.395   | -1.090      | -0.230      | 0.928       |

Source: OECD, TALIS Starting Strong 2024 database.

### Satisfaction with profession (S2PROSAR)

The scale *Satisfaction with profession* (S2PROSAR) was measured using a set of three items (SS2G45H, SS2G45I and SS2G45J). These items assessed ECEC staff's level of agreement with different statements related to their job. For each item, ECEC staff selected one of the following response options: "Strongly disagree", "Disagree", "Agree" and "Strongly agree". Higher scores reflect greater satisfaction with profession. Table 11.320 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for both populations, as well as for the pooled model per level, are presented in Table 11.321. The fit indices for the S2PROSAR scale are not presented here as the scale was measured by just three items, resulting in a model that is just identified and therefore shows a perfect fit. The scale S2PROSAR has a high reliability, generally above 0.700, across all participating countries/territories in both populations.

Table 11.322 presents the results from the measurement invariance testing for S2PROSAR for both levels. As this is a three-item scale, the baseline models in both populations have a perfect fit because the models are just identified. For ISCED level 02, the equal loadings model is within the cut-off criteria for all fit indices. The change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

For U3, the equal loadings model is also within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI, RMSEA and SRMR and close to the cut-off for the CFI. No special caution is required when comparing scale score results across countries/territories.

Table 11.323 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2PROSAR. The loadings for items SS2G45I and SS2G45J are high, while the loading for item SS2G45H is close to the acceptable threshold. Results by participating country/territory show a low loading for item SS2G45H in nine ISCED level 02 participants (Chile, Denmark, Finland, the Flemish Community of Belgium, Germany, Ireland, Japan, Norway and Sweden) and six U3 participants (Canada, the Flemish Community of Belgium, Germany, Ireland, New Zealand and Norway).

**Table 11.320. Items and response categories used in the construction of scale S2PROSAR**

| Scale or item | Question or item wording                                                                                                          |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------|
| S2PROSAR      | We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements? |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i>                        |
|               | Scale mid-point: 2.5                                                                                                              |
| SS2G45H       | If I could decide again, I would still choose to work as an <ECEC staff>.                                                         |
| SS2G45I       | The children value me.                                                                                                            |
| SS2G45J       | Parents or guardians value me as an <ECEC staff>.                                                                                 |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.321. Reliability coefficient alpha for single countries/territories and pooled model for scale S2PROSAR**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 02</b>           |                                 |
| Chile                           | 0.747                           |
| Colombia                        | 0.856                           |
| Denmark                         | 0.714                           |
| Finland                         | 0.730                           |
| Flemish Community (Belgium)     | 0.650                           |
| Germany                         | 0.685                           |
| Ireland                         | 0.696                           |
| Israel                          | 0.810                           |
| Japan                           | 0.752                           |
| Morocco                         | 0.805                           |
| Norway                          | 0.709                           |
| New Zealand                     | 0.734                           |
| Spain                           | 0.765                           |
| Sweden                          | 0.706                           |
| Türkiye                         | 0.803                           |
| International pooled data       | 0.774                           |
| <b>U3</b>                       |                                 |
| Canada                          | 0.771                           |
| Flemish Community (Belgium)     | 0.720                           |
| Germany                         | 0.697                           |
| Ireland                         | 0.661                           |
| Israel                          | 0.794                           |
| Norway                          | 0.707                           |
| New Zealand                     | 0.771                           |
| International pooled data       | 0.739                           |

Note: New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.322. Measurement invariance results from MGCFA for scale S2PROSAR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.993     | 0.989 | 0.082 | 0.035 | -0.007                  | -0.011 | 0.082   | 0.035  |
| Equal loadings and thresholds | 0.971     | 0.986 | 0.091 | 0.151 | -0.022                  | -0.003 | 0.009   | 0.115  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.999     | 0.997 | 0.036 | 0.020 | -0.001                  | -0.003 | 0.036   | 0.020  |
| Equal loadings and thresholds | 0.991     | 0.995 | 0.047 | 0.061 | -0.007                  | -0.002 | 0.011   | 0.041  |

Note: The Flemish Community (Belgium), Germany and New Zealand excluded from measurement invariance testing in the ISCED level 02 population; Canada, New Zealand and Norway are excluded from measurement invariance testing in the U3 population.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.323. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2PROSAR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SS2G45H | 0.447   | -1.631      | -0.869      | 0.269       |
| SS2G45I | 0.925   | -2.661      | -1.827      | -0.265      |
| SS2G45J | 0.873   | -2.356      | -1.457      | 0.128       |

Source: OECD, TALIS Starting Strong 2024 database.

### **Satisfaction with work at this ECEC setting (S2JOBSAR)**

The scale *Satisfaction with work at this ECEC setting* (S2JOBSAR) was measured using a set of four items (SS2G45C, SS2G45E, SS2G45F, SS2G45G). These items assessed ECEC staff's level of agreement with different statements related to their job. For each item, ECEC staff selected one of the following response options: "Strongly disagree", "Disagree", "Agree" and "Strongly agree". Higher scores indicate greater satisfaction with work at the ECEC setting. Item SS2G44G was reverse coded due to its negative wording, aligning its direction with the other items in the scale. Table 11.324 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.325. The scale S2JOBSAR has a high reliability, generally above 0.800, across all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI, TLI and SRMR show a good fit across all countries/territories, except for the TLI of the ISCED level 02 population in Colombia. RMSEA values are at least acceptable across most participating countries/territories, except for the ISCED level 02 population in Colombia, Germany, Ireland, Sweden and Türkiye, as well as the U3 population in Israel.

Table 11.326 presents the results from the measurement invariance testing for S2JOBSAR for both levels. The baseline model fit indices are at least acceptable for both levels. For ISCED level 02, the degree of change between the baseline and the equal loadings model is within the cut-off criteria for the TLI, RMSEA, SRMR and slightly exceeds the cut-off for the CFI. The change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA and is close to the cut-off for the CFI. No special caution is required when comparing scale score results across countries/territories.



For U3, the change between the equal loadings and baseline models is within the acceptable range for the RMSEA and SRMR and is close to the cut-off for the CFI and TLI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the CFI, TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.327 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2JOBSAR. The loadings for all the items are high, except for item SS2G45E for which the loading is within the acceptable range. Results by participating country/territory show a low loading for item SS2G45E in nine ISCED level 02 participants (Chile, Denmark, Finland, the Flemish Community of Belgium, Germany, Japan, Norway, Spain and Sweden) and three U3 participants (Canada, Germany and Ireland). Additionally, item SS2G45G has a low loading in Colombia and Morocco (both ISCED level 02).

**Table 11.324. Items and response categories used in the construction of scale S2JOBSAR**

| Scale or item | Question or item wording                                                                                                          |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------|
| S2JOBSAR      | We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements? |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i>                        |
|               | Scale mid-point: 2.5                                                                                                              |
| SS2G45C       | I enjoy working at this <ECEC setting>.                                                                                           |
| SS2G45E       | I am satisfied with the support that I receive from parents or guardians in this <ECEC setting>.                                  |
| SS2G45F       | I would recommend this <ECEC setting> as a good place to work.                                                                    |
| SS2G45G*      | I would like to change to another <ECEC setting> if that were possible.                                                           |

Source: OECD, TALIS Starting Strong 2024 database.

Note: \* Item was reverse coded.

**Table 11.325. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2JOBSAR**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |              |              |       |
| Chile                           | 0.765            | 0.990         | 0.969        | 0.089        | 0.032 |
| Colombia                        | 0.764            | 0.924         | <b>0.772</b> | <b>0.233</b> | 0.076 |
| Denmark                         | 0.792            | 0.995         | 0.985        | 0.073        | 0.022 |
| Finland                         | 0.813            | 0.998         | 0.995        | 0.051        | 0.014 |
| Flemish Community (Belgium)     | 0.821            | 0.997         | 0.990        | 0.077        | 0.019 |
| Germany                         | 0.819            | 0.990         | 0.970        | <b>0.134</b> | 0.039 |
| Ireland                         | 0.771            | 0.971         | 0.914        | <b>0.131</b> | 0.045 |
| Israel                          | 0.850            | 0.996         | 0.988        | 0.076        | 0.018 |
| Japan                           | 0.803            | 0.996         | 0.987        | 0.073        | 0.018 |
| Morocco                         | 0.730            | 1.000         | 1.001        | 0.000        | 0.007 |
| Norway                          | 0.831            | 0.999         | 0.998        | 0.038        | 0.014 |
| New Zealand                     | 0.871            | 1.000         | 1.000        | 0.000        | 0.000 |
| Spain                           | 0.829            | 0.994         | 0.983        | 0.074        | 0.021 |
| Sweden                          | 0.807            | 0.992         | 0.976        | <b>0.104</b> | 0.023 |
| Türkiye                         | 0.760            | 0.981         | 0.942        | <b>0.127</b> | 0.030 |



| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| International pooled data       | 0.811                           | 0.991         | 0.974 | 0.087        | 0.025 |
| <b>U3</b>                       |                                 |               |       |              |       |
| Canada                          | 0.789                           | 1.000         | 1.001 | 0.000        | 0.010 |
| Flemish Community (Belgium)     | 0.855                           | 0.991         | 0.972 | 0.100        | 0.023 |
| Germany                         | 0.832                           | 0.997         | 0.992 | 0.077        | 0.019 |
| Ireland                         | 0.765                           | 0.996         | 0.989 | 0.050        | 0.019 |
| Israel                          | 0.816                           | 0.990         | 0.970 | <b>0.116</b> | 0.032 |
| Norway                          | 0.852                           | 0.997         | 0.992 | 0.077        | 0.028 |
| New Zealand                     | 0.821                           | 1.000         | 1.000 | 0.000        | 0.000 |
| International pooled data       | 0.824                           | 0.996         | 0.988 | 0.072        | 0.021 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.326. Measurement invariance results from MGCFA for scale S2JOBSAR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.992     | 0.977 | 0.095 | 0.027 | -                       | -      | -       | -      |
| Equal loadings                | 0.982     | 0.977 | 0.095 | 0.051 | -0.011                  | -0.000 | 0.000   | 0.024  |
| Equal loadings and thresholds | 0.971     | 0.985 | 0.078 | 0.111 | -0.011                  | 0.007  | -0.017  | 0.060  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.995     | 0.986 | 0.081 | 0.021 | -                       | -      | -       | -      |
| Equal loadings                | 0.978     | 0.969 | 0.118 | 0.044 | -0.018                  | -0.016 | 0.037   | 0.024  |
| Equal loadings and thresholds | 0.983     | 0.990 | 0.069 | 0.093 | 0.005                   | 0.020  | -0.049  | 0.049  |

Note: New Zealand and Norway are excluded from measurement invariance testing in the U3 population.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.327. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2JOBSAR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SS2G45C | 0.873   | -2.249      | -1.528      | 0.023       |
| SS2G45E | 0.482   | -1.955      | -1.052      | 0.610       |
| SS2G45F | 0.906   | -1.991      | -1.190      | 0.171       |
| SS2G45G | 0.646   | -1.613      | -0.900      | 0.139       |

Source: OECD, TALIS Starting Strong 2024 database.

### Sources of work stress: aspects specific to children's development, well-being and learning (S2STRESC)

The scale *Sources of work stress: aspects specific to children's development, well-being and learning* (S2STRESC) was measured using a set of five items (SS2G47E, SS2G47F, SS2G47H, SS2G47I and SS2G47K). These items assessed the extent to which various factors were sources of stress in ECEC staff's work. For each item, ECEC staff selected one of the following response options: "Not at all", "To

some extent", "Quite a bit" and "A lot". Higher scores indicate greater perceived stress in relation to children's development, well-being and learning. Table 11.328 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.329. The scale S2STRESC has a high reliability, generally above 0.75, across all participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI shows a good model fit in most countries/territories, except for Germany (ISCED level 02). The TLI also shows a good model fit across most participating countries/territories, except for Germany (ISCED level 02), Türkiye (ISCED level 02) and Canada (U3). The SRMR is good in all countries/territories in both populations. The RMSEA is at least acceptable in most ISCED level 02 countries/territories, except for Colombia, the Flemish Community of Belgium, Germany, Morocco and Türkiye. For U3, the RMSEA exceeds the acceptable cut-off in Canada, the Flemish Community of Belgium, Germany and Israel. Based on the single CFA model fit results, the scale S2STRESC works well across all countries/territories except Germany (ISCED level 02), where the CFI, TLI and RMSEA do not meet the acceptable cut-off criteria.

Table 11.330 presents the results from the measurement invariance testing for S2STRESC for both levels. The baseline model fit indices are at least acceptable for both levels. For ISCED level 02, the degree of change between the baseline and equal loadings models is within the cut-off criteria for all fit indices. The change between the equal loadings and the equal loadings and thresholds models exceeds the cut-offs for all indices. The equal loadings and thresholds model shows a poor model fit. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

For U3, the change between the equal loadings and baseline models is within the acceptable range for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-offs for all indices. The equal loadings and thresholds model shows a poor model fit. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.331 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2STRESC. The loadings for most items are high, except for items SS2G47I and SS2G47K for which the loadings fall within the acceptable range. Results by participating country/territory show a low loading for item SS2G47K in six ISCED level 02 participants (Denmark, Finland, the Flemish Community of Belgium, Norway, Spain and Sweden) and three U3 participants (the Flemish Community of Belgium, Germany and Norway).

**Table 11.328. Items and response categories used in the construction of scale S2STRESC**

| Scale or item | Question or item wording                                                                                                                                                                                                                           |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2STRESC      | Thinking about your job at this <ECEC setting>, to what extent are the following sources of stress in your work?<br><i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i><br>Scale mid-point: 2.5 |
| SS2G47E       | Being held responsible for children's development, well-being and learning                                                                                                                                                                         |
| SS2G47F       | Managing <classroom/playgroup/group> behaviour                                                                                                                                                                                                     |
| SS2G47H       | Accommodating children with special education needs                                                                                                                                                                                                |
| SS2G47I       | Having too many children in my <classroom/playgroup/group>                                                                                                                                                                                         |
| SS2G47K       | Having to adapt my practices with children due to unexpected disruptions (e.g. natural disasters, public health emergencies/pandemics, humanitarian crises)                                                                                        |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.329. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2STRESC**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |              |              |       |
| Chile                           | 0.855            | 0.987         | 0.973        | 0.088        | 0.026 |
| Colombia                        | 0.869            | 0.950         | 0.901        | <b>0.115</b> | 0.053 |
| Denmark                         | 0.813            | 0.982         | 0.964        | 0.098        | 0.031 |
| Finland                         | 0.779            | 0.984         | 0.967        | 0.066        | 0.029 |
| Flemish Community (Belgium)     | 0.755            | 0.958         | 0.915        | <b>0.121</b> | 0.044 |
| Germany                         | 0.741            | <b>0.896</b>  | <b>0.791</b> | <b>0.148</b> | 0.048 |
| Ireland                         | 0.825            | 0.987         | 0.973        | 0.074        | 0.034 |
| Israel                          | 0.845            | 0.998         | 0.996        | 0.035        | 0.014 |
| Japan                           | 0.841            | 0.983         | 0.966        | 0.099        | 0.032 |
| Morocco                         | 0.823            | 0.984         | 0.968        | <b>0.116</b> | 0.035 |
| Norway                          | 0.775            | 0.976         | 0.951        | 0.096        | 0.040 |
| New Zealand                     | 0.876            | 0.988         | 0.981        | 0.078        | 0.039 |
| Spain                           | 0.777            | 0.966         | 0.932        | 0.100        | 0.047 |
| Sweden                          | 0.813            | 0.984         | 0.968        | 0.084        | 0.037 |
| Türkiye                         | 0.805            | 0.948         | <b>0.896</b> | <b>0.168</b> | 0.061 |
| International pooled data       | 0.803            | 0.967         | 0.934        | 0.089        | 0.038 |
| U3                              |                  |               |              |              |       |
| Canada                          | 0.768            | 0.935         | <b>0.869</b> | <b>0.126</b> | 0.052 |
| Flemish Community (Belgium)     | 0.771            | 0.972         | 0.945        | <b>0.117</b> | 0.047 |
| Germany                         | 0.725            | 0.956         | 0.913        | <b>0.103</b> | 0.038 |
| Ireland                         | 0.809            | 0.970         | 0.939        | 0.099        | 0.038 |
| Israel                          | 0.793            | 0.957         | 0.913        | <b>0.103</b> | 0.047 |
| Norway                          | 0.784            | 0.983         | 0.966        | 0.078        | 0.031 |
| New Zealand                     | 0.814            | 0.988         | 0.981        | 0.078        | 0.039 |
| International pooled data       | 0.780            | 0.961         | 0.922        | 0.100        | 0.039 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.330. Measurement invariance results from MGCFA for scale S2STRESC with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.973     | 0.946 | 0.107 | 0.038 | -                       | -      | -       | -      |
| Equal loadings                | 0.970     | 0.966 | 0.085 | 0.051 | -0.003                  | 0.020  | -0.022  | 0.013  |
| Equal loadings and thresholds | 0.808     | 0.887 | 0.155 | 0.171 | -0.162                  | -0.078 | 0.069   | 0.119  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.961     | 0.921 | 0.108 | 0.042 | -                       | -      | -       | -      |
| Equal loadings                | 0.961     | 0.953 | 0.083 | 0.057 | 0.000                   | 0.032  | -0.025  | 0.014  |

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| Equal loadings and thresholds | 0.821     | 0.887 | 0.129 | 0.153 | -0.140                  | -0.066 | 0.046   | 0.096  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.331. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2STRESC**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SS2G47E | 0.796   | -0.702      | 0.270       | 1.058       |
| SS2G47F | 0.864   | -0.791      | 0.126       | 0.918       |
| SS2G47H | 0.647   | -0.759      | 0.130       | 0.886       |
| SS2G47I | 0.568   | -0.569      | 0.161       | 0.760       |
| SS2G47K | 0.489   | -0.165      | 0.776       | 1.427       |

Source: OECD, TALIS Starting Strong 2024 database.

### Sources of work stress: aspects related to capacity, resources and time (S2STRESO)

The scale *Sources of work stress: aspects related to capacity, resources and time* (S2STRESO) was measured using a set of five items. These items (SS2G47C, SS2G47D, SS2G47G, SS2G47J and SS2G47L) assessed the extent to which various factors were sources of stress in ECEC staff's work. For each item, ECEC staff selected one of the following response options: "Not at all", "To some extent", "Quite a bit" and "A lot". Higher scores in this scale indicate greater perceived stress in terms of capacity, resources and time. Table 11.332 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.333. The scale S2STRESO has a high reliability that is above 0.75 in most participating countries/territories in both populations. The single country/territory model fit is at least acceptable in most countries/territories. The CFI, TLI, RMSEA and SRMR all show a good fit across most countries/territories. The only instance where a cut-off is exceeded occurs in Chile (ISCED level 02), where the RMSEA slightly exceeds the acceptable threshold.

Table 11.334 presents the results from the measurement invariance testing for S2STRESO for both levels. The baseline model fit indices are good for both levels. For ISCED level 02, the degree of change between the baseline and the equal loadings models is within the cut-off criteria for the RMSEA and SRMR and slightly exceeds the cut-offs for the CFI and TLI. The change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all fit indices. Furthermore, the equal loadings and thresholds model shows a poor model fit. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

For U3, the change between the equal loadings and baseline models is within the acceptable range for the TLI, RMSEA and SRMR and slightly exceeds the cut-off for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all indices. However, the equal loadings and thresholds model shows an acceptable TLI, and close to acceptable CFI and RMSEA values. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

Table 11.335 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2STRESO. The loadings for all the items are at least acceptable.

Results by participating country/territory show a low loading for item SS2G47G in Morocco (ISCED level 02), New Zealand (U3) and Norway (ISCED level 02); for item SS2G47D in Türkiye (ISCED level 02); and for item SS2G47L in the Flemish Community of Belgium (ISCED level 02).

**Table 11.332. Items and response categories used in the construction of scale S2STRESO**

| Scale or item | Question or item wording                                                                                                                                                                                                                           |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2STRESO      | Thinking about your job at this <ECEC setting>, to what extent are the following sources of stress in your work?<br><i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i><br>Scale mid-point: 2.5 |
| SS2G47C       | Having too much administrative work to do (e.g. filling out forms)                                                                                                                                                                                 |
| SS2G47D       | Having extra duties due to absent <ECEC staff>                                                                                                                                                                                                     |
| SS2G47G       | Addressing parent or guardian concerns                                                                                                                                                                                                             |
| SS2G47J       | Having too many tasks to do at the same time                                                                                                                                                                                                       |
| SS2G47L       | Lacking resources (e.g. financial support, material resources)                                                                                                                                                                                     |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.333. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2STRESO**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                  |               |       |       |       |
| Chile                           | 0.800            | 0.961         | 0.923 | 0.110 | 0.037 |
| Colombia                        | 0.833            | 0.950         | 0.901 | 0.099 | 0.049 |
| Denmark                         | 0.796            | 0.989         | 0.977 | 0.064 | 0.022 |
| Finland                         | 0.798            | 0.993         | 0.986 | 0.041 | 0.016 |
| Flemish Community (Belgium)     | 0.707            | 0.985         | 0.969 | 0.052 | 0.022 |
| Germany                         | 0.783            | 0.997         | 0.993 | 0.031 | 0.015 |
| Ireland                         | 0.850            | 0.999         | 0.997 | 0.021 | 0.015 |
| Israel                          | 0.829            | 0.991         | 0.982 | 0.059 | 0.020 |
| Japan                           | 0.844            | 0.993         | 0.987 | 0.060 | 0.019 |
| Morocco                         | 0.770            | 0.993         | 0.986 | 0.047 | 0.020 |
| Norway                          | 0.753            | 1.000         | 1.007 | 0.000 | 0.013 |
| New Zealand                     | 0.867            | 1.000         | 1.020 | 0.000 | 0.019 |
| Spain                           | 0.750            | 0.982         | 0.965 | 0.048 | 0.025 |
| Sweden                          | 0.817            | 1.000         | 1.000 | 0.008 | 0.009 |
| Türkiye                         | 0.776            | 0.998         | 0.996 | 0.025 | 0.015 |
| International pooled data       | 0.787            | 0.998         | 0.996 | 0.018 | 0.008 |
| U3                              |                  |               |       |       |       |
| Canada                          | 0.806            | 0.986         | 0.972 | 0.064 | 0.027 |
| Flemish Community (Belgium)     | 0.715            | 0.980         | 0.959 | 0.053 | 0.033 |
| Germany                         | 0.779            | 0.999         | 0.997 | 0.021 | 0.013 |
| Ireland                         | 0.843            | 0.991         | 0.982 | 0.059 | 0.023 |
| Israel                          | 0.831            | 0.996         | 0.993 | 0.032 | 0.015 |
| Norway                          | 0.795            | 1.000         | 1.003 | 0.000 | 0.016 |

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| New Zealand                     | 0.784            | 1.000         | 1.020 | 0.000 | 0.019 |
| International pooled data       | 0.804            | 0.998         | 0.997 | 0.021 | 0.010 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.334. Measurement invariance results from MGCFA for scale S2STRESSO with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.990     | 0.980 | 0.053 | 0.021 | -                       | -      | -       | -      |
| Equal loadings                | 0.975     | 0.971 | 0.063 | 0.041 | -0.015                  | -0.009 | 0.011   | 0.020  |
| Equal loadings and thresholds | 0.653     | 0.797 | 0.169 | 0.198 | -0.322                  | -0.175 | 0.105   | 0.156  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.994     | 0.988 | 0.042 | 0.021 | -                       | -      | -       | -      |
| Equal loadings                | 0.987     | 0.985 | 0.047 | 0.032 | -0.007                  | -0.003 | 0.005   | 0.011  |
| Equal loadings and thresholds | 0.888     | 0.929 | 0.103 | 0.119 | -0.099                  | -0.056 | 0.055   | 0.087  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.335. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2STRESSO**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SS2G47C | 0.663   | -0.664      | 0.151       | 0.837       |
| SS2G47D | 0.568   | -0.562      | 0.245       | 0.930       |
| SS2G47G | 0.553   | -0.747      | 0.387       | 1.215       |
| SS2G47J | 0.865   | -0.940      | -0.026      | 0.723       |
| SS2G47L | 0.574   | -0.681      | 0.287       | 0.922       |

Source: OECD, TALIS Starting Strong 2024 database.

### Level of stress and its impact on staff well-being (S2STRESS)

The scale *Level of stress and its impact on staff well-being* (S2STRESS) was measured using four items (SS2G46A, SS2G46B, SS2G46C and SS2G46D). These items assessed the extent to which different situations related to well-being and stress occur. Response options included: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher scores reflect greater perceived stress (and less perceived well-being). Item SS2G46B was reverse coded, as it was the only positive statement about well-being, to ensure it had the same direction as the rest of the items. Table 11.336 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fits for both populations, as well as for the pooled model per level, are presented in Table 11.337. The scale S2STRESS has a high reliability, generally above 0.75, across most participating countries/territories in both populations, except in Norway, where the reliability in both populations is below 0.38. The single country/territory model fit is at least acceptable in most countries/territories. The CFI, TLI and SRMR show a good fit across all countries/territories, while the

RMSEA is at least acceptable in all countries/territories except in the Flemish Community of Belgium in ISCED level 02.

Table 11.338 presents the results from the measurement invariance testing for S2STRESS for both levels. The baseline model fit indices are at least acceptable for both levels. For ISCED level 02, the degree of change between the baseline and the equal loadings models is within the cut-off criteria for the RMSEA and SRMR and slightly exceeds the cut-off for the CFI and TLI. The change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all indices. However, it is close to the cut-off for the TLI and RMSEA, and the equal loadings and thresholds model also shows acceptable CFI and TLI values. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

For U3, the change between the equal loadings and baseline models exceeds the cut-off criteria for all indices, although only marginally so for the SRMR. The degree of change between the equal loadings and the equal loadings and thresholds models is within the acceptable range for the TLI and RMSEA but exceeds the cut-offs for the CFI and SRMR. The equal loadings and thresholds model shows an acceptable TLI. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.339 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2STRESS. The loadings for all of the items are high except for item SS2G46B that shows a low loading. Results by participating country/territory also show a low loading for item SS2G46B in ten ISCED level 02 participants (Chile, Colombia, Denmark, Germany, Israel, Morocco, Norway, Spain, Sweden and Türkiye) and five U3 participants (Canada, the Flemish Community of Belgium, Ireland, Israel and Norway).

**Table 11.336. Items and response categories used in the construction of scale S2STRESS**

| Scale or item | Question or item wording                                                                             |
|---------------|------------------------------------------------------------------------------------------------------|
| S2STRESS      | In your experience as an <ECEC staff> at this <ECEC setting>, to what extent do the following occur? |
|               | Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot      |
|               | Scale mid-point: 2.5                                                                                 |
| SS2G46A       | I experience stress in my work.                                                                      |
| SS2G46B*      | My job leaves me time for my personal life.                                                          |
| SS2G46C       | My job negatively impacts my mental health.                                                          |
| SS2G46D       | My job negatively impacts my physical health.                                                        |

Source: OECD, TALIS Starting Strong 2024 database.

Note: \* Item was reverse coded.

**Table 11.337. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2STRESS**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |       |              |       |
| Chile                           | 0.811            | 0.998         | 0.993 | 0.067        | 0.017 |
| Colombia                        | 0.728            | 0.996         | 0.987 | 0.071        | 0.039 |
| Denmark                         | 0.791            | 0.998         | 0.993 | 0.059        | 0.014 |
| Finland                         | 0.809            | 0.993         | 0.979 | 0.080        | 0.020 |
| Flemish Community (Belgium)     | 0.814            | 0.988         | 0.965 | <b>0.126</b> | 0.024 |



| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |       |       |
|---------------------------------|---------------------------------|---------------|-------|-------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA | SRMR  |
| Germany                         | 0.792                           | 0.999         | 0.997 | 0.033 | 0.010 |
| Ireland                         | 0.849                           | 0.997         | 0.990 | 0.057 | 0.015 |
| Israel                          | 0.715                           | 0.998         | 0.994 | 0.044 | 0.014 |
| Japan                           | 0.851                           | 0.998         | 0.993 | 0.074 | 0.014 |
| Morocco                         | 0.767                           | 1.000         | 1.001 | 0.000 | 0.006 |
| Norway                          | <b>0.370</b>                    | 0.999         | 0.996 | 0.034 | 0.015 |
| New Zealand                     | 0.882                           | 1.000         | 1.029 | 0.000 | 0.018 |
| Spain                           | 0.816                           | 0.999         | 0.997 | 0.033 | 0.009 |
| Sweden                          | 0.824                           | 0.998         | 0.993 | 0.062 | 0.012 |
| Türkiye                         | 0.769                           | 0.998         | 0.994 | 0.050 | 0.013 |
| International pooled data       | 0.782                           | 0.999         | 0.997 | 0.030 | 0.008 |
| <b>U3</b>                       |                                 |               |       |       |       |
| Canada                          | 0.777                           | 1.000         | 1.001 | 0.000 | 0.011 |
| Flemish Community (Belgium)     | 0.796                           | 1.000         | 1.002 | 0.000 | 0.010 |
| Germany                         | 0.816                           | 0.995         | 0.985 | 0.088 | 0.017 |
| Ireland                         | 0.810                           | 1.000         | 1.003 | 0.000 | 0.003 |
| Israel                          | 0.726                           | 0.994         | 0.981 | 0.063 | 0.025 |
| Norway                          | <b>0.357</b>                    | 0.992         | 0.976 | 0.096 | 0.021 |
| New Zealand                     | 0.772                           | 1.000         | 1.029 | 0.000 | 0.018 |
| International pooled data       | 0.738                           | 1.000         | 0.999 | 0.014 | 0.006 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.338. Measurement invariance results from MGCFA for scale S2STRESS with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.997     | 0.991 | 0.061 | 0.016 | -                       | -      | -       | -      |
| Equal loadings                | 0.981     | 0.977 | 0.101 | 0.050 | -0.016                  | -0.015 | 0.040   | 0.034  |
| Equal loadings and thresholds | 0.920     | 0.958 | 0.136 | 0.165 | -0.061                  | -0.019 | 0.035   | 0.115  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.997     | 0.992 | 0.054 | 0.014 | -                       | -      | -       | -      |
| Equal loadings                | 0.947     | 0.930 | 0.158 | 0.067 | -0.050                  | -0.062 | 0.103   | 0.053  |
| Equal loadings and thresholds | 0.882     | 0.931 | 0.156 | 0.171 | -0.066                  | 0.002  | -0.002  | 0.103  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.

Source: OECD, TALIS Starting Strong 2024 database.



**Table 11.339. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2STRESS**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SS2G46A | 0.756   | -1.124      | 0.154       | 1.000       |
| SS2G46B | 0.265   | -1.063      | 0.020       | 1.411       |
| SS2G46C | 0.970   | -0.216      | 0.871       | 1.538       |
| SS2G46D | 0.791   | -0.313      | 0.805       | 1.519       |

Source: OECD, TALIS Starting Strong 2024 database.

### *Complex scales from the leader questionnaire*

#### **Professional development needs, overall (S2LPDEV)**

ECEC setting leaders were asked to indicate the extent to which they currently need professional learning activities in 14 different areas. For each area, they selected one of the following response options: “No need at present”, “Low level of need”, “Moderate level of need” and “High level of need”. Responses to 14 of the items in this question (listed in Table 11.340) were used to derive a scale reflecting teachers’ *Professional development needs, overall* (S2LPDEV). Higher values on this scale indicate a greater need for professional development. Table 11.340 provides the item names as used in the dataset, question stem and response options for the items belonging to this scale, as well as the scale mid-point.

Scale reliabilities and model fit for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.341. The reliabilities for S2LPDEV are above 0.700 in all populations. In terms of model fit, the CFI and TLI values for S2LPDEV are generally acceptable across all participating countries/territories, except for both the ISCED level 02 and U3 populations in the Flemish Community of Belgium and Germany, and the U3 population in New Zealand. The SRMR falls within the acceptable cut-off criterion for most populations, except for the U3 population in the Flemish Community of Belgium and New Zealand. The RMSEA exceeds the cut-off in several populations, particularly in the ISCED level 02 population in Germany and Türkiye, where it is above 0.130, and the U3 population in New Zealand and Norway, where it is above 0.200. Based on the single CFA model fit results, the scale S2LPDEV works well across all populations except in the Flemish Community of Belgium (ISCED level 02 and U3), Germany (ISCED level 02 and U3) and New Zealand (U3), where the CFI, TLI and RMSEA – and in some cases also the SRMR – do not meet the acceptable cut-off criteria.

Table 11.342 presents the results from the measurement invariance testing for S2LPDEV for the ISCED level 02 and U3 populations. The results are very similar for both populations. The baseline models show an acceptable model fit based on the CFI, TLI, SRMR; RMSEA is very close to the acceptable cut-off. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all model fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criteria for the TLI, RMSEA and close to the cut-off criteria for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories for the ISCED level 02 and U3 populations.

Table 11.343 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LPDEV. All item loadings are high, except for item SL2G11N, for which the loading falls within the acceptable range. Results by participating country/territory show a low loading for item SL2G11N in the Flemish Community of Belgium (U3), Germany (ISCED level 02 and U3) and Ireland (U3); for item SL2G11F in both the ISCED level 02 and U3 populations in the Flemish Community of Belgium; and for item SL2G11B in Spain (ISCED level 02).

**Table 11.340. Items and response categories used in the construction of scale S2LPDEV**

| Scale or item | Question or item wording                                                                                                                                     |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2LPDEV       | For each of the areas listed below, please indicate the extent to which you currently need professional development                                          |
|               | <i>Recoded response categories for scaling: 1=No need at present; 2=Low level of need; 3=Moderate level of need; 4=High level of need</i>                    |
|               | Scale mid-point: 2.5                                                                                                                                         |
| SL2G11A       | Knowledge and understanding of new developments in leadership research and theory                                                                            |
| SL2G11B       | Knowledge and understanding of current national/local policies on <ECEC>                                                                                     |
| SL2G11C       | Using data for improving the quality of the <ECEC setting> (e.g. feedback from <ECEC staff> and parents or guardians)                                        |
| SL2G11D       | Designing the <ECEC setting's> goals for children's development, well-being and learning                                                                     |
| SL2G11E       | Knowledge and understanding of research and theories on pedagogy of young children                                                                           |
| SL2G11F       | Using <digital resources and tools> to facilitate <ECEC setting> management (e.g. to facilitate <ECEC staff> work, to communicate with parents or guardians) |
| SL2G11G       | Collaborating with parents or guardians                                                                                                                      |
| SL2G11H       | Collaborating with other <ECEC settings> or <ISCED 2011 level 1> schools                                                                                     |
| SL2G11I       | Collaborating with community services (e.g. health services, social services)                                                                                |
| SL2G11J       | Observing <ECEC staff's> practices and <ECEC staff>-child interactions                                                                                       |
| SL2G11K       | Providing effective feedback to <ECEC staff>                                                                                                                 |
| SL2G11L       | Promoting <ECEC staff> well-being                                                                                                                            |
| SL2G11N       | Financial management                                                                                                                                         |
| SL2G11O       | Promoting equity and diversity                                                                                                                               |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.341. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LPDEV**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |              |              |       |
| Chile                           | 0.940            | 0.946         | 0.936        | <b>0.106</b> | 0.070 |
| Colombia                        | 0.930            | 0.937         | 0.926        | 0.095        | 0.100 |
| Denmark                         | 0.949            | 0.942         | 0.931        | <b>0.111</b> | 0.058 |
| Finland                         | 0.924            | 0.958         | 0.951        | 0.087        | 0.074 |
| Flemish Community (Belgium)     | 0.891            | <b>0.857</b>  | <b>0.831</b> | <b>0.114</b> | 0.079 |
| Germany                         | 0.900            | <b>0.870</b>  | <b>0.847</b> | <b>0.136</b> | 0.090 |
| Ireland                         | 0.934            | 0.931         | 0.918        | <b>0.103</b> | 0.082 |
| Israel                          | 0.948            | 0.970         | 0.949        | 0.100        | 0.058 |
| Japan                           | 0.932            | 0.964         | 0.957        | 0.068        | 0.073 |
| Morocco                         | 0.945            | 0.948         | 0.938        | <b>0.105</b> | 0.051 |
| Norway                          | 0.897            | 0.964         | 0.940        | <b>0.140</b> | 0.083 |
| New Zealand                     | 0.936            | 1.000         | 1.129        | 0.000        | 0.058 |
| Spain                           | 0.932            | 0.950         | 0.941        | 0.078        | 0.060 |
| Sweden                          | 0.925            | 0.944         | 0.934        | 0.092        | 0.071 |
| Türkiye                         | 0.959            | 0.940         | 0.929        | <b>0.137</b> | 0.070 |
| International pooled data       | 0.948            | 0.948         | 0.939        | 0.098        | 0.043 |
| U3                              |                  |               |              |              |       |
| Canada                          | 0.944            | 0.924         | 0.911        | <b>0.129</b> | 0.086 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |              |
|---------------------------------|---------------------------------|---------------|--------------|--------------|--------------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR         |
| Flemish Community (Belgium)     | 0.876                           | <b>0.811</b>  | <b>0.776</b> | <b>0.117</b> | <b>0.117</b> |
| Germany                         | 0.890                           | <b>0.859</b>  | <b>0.833</b> | <b>0.129</b> | 0.087        |
| Ireland                         | 0.941                           | 0.924         | 0.910        | <b>0.119</b> | 0.086        |
| Israel                          | 0.956                           | 0.967         | 0.945        | 0.088        | 0.094        |
| Norway                          | 0.836                           | 0.941         | 0.902        | <b>0.211</b> | 0.096        |
| New Zealand                     | 0.927                           | <b>0.587</b>  | <b>0.312</b> | <b>0.281</b> | <b>0.191</b> |
| International pooled data       | 0.920                           | 0.920         | 0.905        | 0.095        | 0.066        |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.342. Measurement invariance results from MGCFA for scale S2LPDEV with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |       |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|-------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.945     | 0.935 | 0.104 | 0.072 | -                       | -     | -       | -      |
| Equal loadings                | 0.950     | 0.949 | 0.092 | 0.086 | 0.005                   | 0.014 | -0.012  | 0.014  |
| Equal loadings and thresholds | 0.937     | 0.950 | 0.092 | 0.126 | -0.013                  | 0.001 | -0.001  | 0.040  |
| <b>U3</b>                     |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.924     | 0.910 | 0.114 | 0.091 | -                       | -     | -       | -      |
| Equal loadings                | 0.940     | 0.937 | 0.095 | 0.100 | 0.016                   | 0.027 | -0.019  | 0.009  |
| Equal loadings and thresholds | 0.926     | 0.938 | 0.094 | 0.131 | -0.014                  | 0.001 | -0.001  | 0.031  |

Note: Japan and New Zealand are excluded from measurement invariance testing in the ISCED level 02 population; New Zealand is excluded from measurement invariance testing in the U3 population.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.343. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LPDEV**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SL2G11A | 0.706   | -1.107      | -0.192      | 0.981       |
| SL2G11B | 0.727   | -1.127      | -0.123      | 0.941       |
| SL2G11C | 0.756   | -1.167      | -0.188      | 0.967       |
| SL2G11D | 0.817   | -1.021      | -0.078      | 0.873       |
| SL2G11E | 0.762   | -1.099      | -0.100      | 0.889       |
| SL2G11F | 0.678   | -0.930      | -0.081      | 0.873       |
| SL2G11G | 0.839   | -0.707      | 0.247       | 1.041       |
| SL2G11H | 0.791   | -0.784      | 0.198       | 1.157       |
| SL2G11I | 0.739   | -0.909      | 0.061       | 1.053       |
| SL2G11J | 0.828   | -0.982      | -0.057      | 0.939       |
| SL2G11K | 0.838   | -1.060      | -0.179      | 0.800       |
| SL2G11L | 0.815   | -1.187      | -0.266      | 0.701       |
| SL2G11N | 0.565   | -0.916      | -0.116      | 0.747       |
| SL2G11O | 0.773   | -0.874      | 0.067       | 1.083       |

Source: OECD, TALIS Starting Strong 2024 database.

### Professional development needs: leadership and setting management (ISCED 02 only) (S2LPDLS)

The scale of *Professional development needs: leadership and setting management* (S2LPDLS) was composed by a subset of four items (SL2G11A, SL2G11L, SL2G11M and SL2G11N). In these items, ECEC setting leaders had to indicate the extent to which they currently need professional learning activities, using the following response options: “No need at present”, “Low level of need”, “Moderate level of need” and “High level of need”. Higher values on this scale indicate a greater need for professional development. Table 11.344 provides the item names as used in the dataset, question stem and response options for the items belonging to this scale, as well as the scale mid-point. The scale S2LPDLS is only available for the ISCED level 02 population.

Scale reliabilities and model fit for all countries/territories, as well as for the pooled model for ISCED level 02 are presented in Table 11.345. The reliabilities for S2LPDLS are above 0.700 across all ISCED level 02 countries/territories. As shown in Table 11.345, the CFI for S2LPDLS is within the cut-off criterion in all participating countries/territories. This is also the case for the TLI values, except for Colombia and New Zealand. The RMSEA exceeds the cut-off criterion in Colombia, Denmark, the Flemish Community of Belgium and New Zealand. The SRMR is mostly acceptable, only exceeding the cut-off in New Zealand. Based on the single CFA model fit results, the scale S2LPDLS works well across all countries/territories except in New Zealand, where the TLI, RMSEA and SRMR do not meet the acceptable cut-off criteria.

Table 11.346 presents the results from the measurement invariance testing for S2LPDLS for the ISCED level 02 population. The baseline model shows an acceptable model fit across all indices. The degree of change between the baseline and the equal loadings models is within the acceptable limit for the SRMR and RMSEA and is close to the cut-off criteria for the CFI and TLI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criteria for the TLI and RMSEA, is close to the cut-off for the CFI, but exceeds it for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.347 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LPDLS. All item loadings are high. Results by participating country/territory show a low loading for item SL2G11A in Chile (ISCED level 02), Germany (ISCED levels 02 and U3), Japan (ISCED level 02) and Spain (ISCED level 02); for item SL2G11L in Colombia (ISCED level 02) and the Flemish Community of Belgium (U3); and for item SL2G11N in Germany (ISCED level 02).

**Table 11.344. Items and response categories used in the construction of scale S2LPDLS**

| Scale or item | Question or item wording                                                                                                                  |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| S2LPDLS       | For each of the areas listed below, please indicate the extent to which you currently need professional development                       |
|               | <i>Recoded response categories for scaling: 1=No need at present; 2=Low level of need; 3=Moderate level of need; 4=High level of need</i> |
|               | Scale mid-point: 2.5                                                                                                                      |
| SL2G11A       | Knowledge and understanding of new developments in leadership research and theory                                                         |
| SL2G11L       | Promoting <ECEC staff> well-being                                                                                                         |
| SL2G11M       | Human resource management                                                                                                                 |
| SL2G11N       | Financial management                                                                                                                      |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.345. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LPDLS**

| Participating country/territory | Reliability      | CFA model fit |              |              |              |
|---------------------------------|------------------|---------------|--------------|--------------|--------------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR         |
| ISCED level 02                  |                  |               |              |              |              |
| Chile                           | 0.802            | 0.995         | 0.986        | 0.097        | 0.031        |
| Colombia                        | 0.718            | 0.940         | <b>0.821</b> | <b>0.164</b> | 0.045        |
| Denmark                         | 0.880            | 0.995         | 0.984        | <b>0.127</b> | 0.023        |
| Finland                         | 0.834            | 1.000         | 1.001        | 0.000        | 0.012        |
| Flemish Community (Belgium)     | 0.781            | 0.988         | 0.965        | <b>0.150</b> | 0.039        |
| Germany                         | 0.715            | 1.000         | 1.001        | 0.000        | 0.021        |
| Ireland                         | 0.816            | 0.999         | 0.997        | 0.030        | 0.020        |
| Israel                          | 0.839            | 1.000         | 1.002        | 0.000        | 0.005        |
| Japan                           | 0.800            | 0.994         | 0.981        | 0.075        | 0.033        |
| Morocco                         | 0.830            | 0.996         | 0.989        | 0.072        | 0.016        |
| Norway                          | 0.820            | 0.998         | 0.995        | 0.032        | 0.031        |
| New Zealand                     | 0.831            | 0.963         | <b>0.888</b> | <b>0.275</b> | <b>0.117</b> |
| Spain                           | 0.762            | 0.988         | 0.963        | 0.087        | 0.025        |
| Sweden                          | 0.806            | 0.999         | 0.998        | 0.026        | 0.016        |
| Türkiye                         | 0.889            | 0.999         | 0.997        | 0.044        | 0.010        |
| International pooled data       | 0.836            | 0.992         | 0.975        | 0.098        | 0.021        |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 model.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.346. Measurement invariance results from MGCFA for scale S2LPDLS with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.994     | 0.983 | 0.093 | 0.024 | -                       | -      | -       | -      |
| Equal loadings                | 0.976     | 0.970 | 0.125 | 0.052 | -0.018                  | -0.013 | 0.031   | 0.028  |
| Equal loadings and thresholds | 0.949     | 0.972 | 0.120 | 0.142 | -0.028                  | 0.002  | -0.005  | 0.090  |

Note: Japan and New Zealand are excluded from measurement invariance testing.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.347. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LPDLS**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SL2G11M | 0.952   | -1.031      | -0.153      | 0.771       |
| SL2G11A | 0.627   | -1.107      | -0.191      | 0.980       |
| SL2G11L | 0.722   | -1.187      | -0.266      | 0.701       |
| SL2G11N | 0.710   | -0.916      | -0.116      | 0.747       |

Source: OECD, TALIS Starting Strong 2024 database.

### Professional development needs: pedagogy and pedagogical leadership (S2LPDPL)

The scale of *Professional development needs: pedagogy and pedagogical leadership* (S2LPDPL) was composed by a subset of 11 items, listed in Table 11.348. In these items, ECEC setting leaders had to indicate the extent to which they currently need professional learning activities, using the following response options: “No need at present”, “Low level of need”, “Moderate level of need” and “High level of need”. Higher values on this scale indicate a greater need for professional development. Table 11.348 provides the item names as used in the dataset, question stem and response options for the items belonging to this scale, as well as the scale mid-point.

Scale reliabilities and model fit for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.349. The reliabilities for S2LPDPL are above 0.700 in all populations. In terms of model fit, the CFI and TLI values for S2LPDPL are generally acceptable across all participating countries/territories, except for both the ISCED level 02 and U3 populations in the Flemish Community of Belgium and New Zealand, the ISCED level 02 population in Germany, and – specifically for TLI – the ISCED level 02 population in Norway. The SRMR falls within the acceptable cut-off criterion for most populations, except for the ISCED level 02 population in Norway and the U3 population in the Flemish Community of Belgium, Israel and New Zealand. The RMSEA exceeds the cut-off in most populations, particularly in the ISCED level 02 population in Germany, Israel, New Zealand, Norway and Türkiye; and the U3 population in Canada, Israel and New Zealand, where it is above 0.130. Based on the single CFA model fit results, the scale S2LPDPL works well across all populations except in the Flemish Community of Belgium (ISCED level 02 and U3), Germany (ISCED level 02) and New Zealand (ISCED level 02 and U3), where the CFI, TLI and RMSEA – and in some cases also the SRMR – do not meet the acceptable cut-off criteria.

Table 11.350 presents the results from the measurement invariance testing for S2LPDPL for the ISCED level 02 and U3 populations. The results are very similar for both populations. The baseline models show an acceptable model fit based on the CFI, TLI and SRMR, with the RMSEA being very close to the acceptable range. The degree of change between the baseline and the equal loadings models is within the cut-off criteria for all model fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criteria for the TLI, RMSEA and close to the cut-off criteria for the CFI and SRMR. No special caution is required when comparing scale score results across countries/territories for the ISCED level 02 and U3 populations.

Table 11.351 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LPDPL. All item loadings are high, except for items SL2G11B and SL2G11F, for which the loadings are within the acceptable range. Results by participating country/territory show a low loading for these two items; for item SL2G11B in Germany (U3), Japan and Spain (both ISCED level 02); and for item SL2G11F in both the ISCED level 02 and U3 populations in the Flemish Community of Belgium.

**Table 11.348. Items and response categories used in the construction of scale S2LPDPL**

| Scale or item | Question or item wording                                                                                                                  |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| S2LPDPL       | For each of the areas listed below, please indicate the extent to which you currently need professional development                       |
|               | <i>Recoded response categories for scaling: 1=No need at present; 2=Low level of need; 3=Moderate level of need; 4=High level of need</i> |
|               | Scale mid-point: 2.5                                                                                                                      |
| SL2G11B       | Knowledge and understanding of current national/local policies on <ECEC>                                                                  |
| SL2G11C       | Using data for improving the quality of the <ECEC setting> (e.g. feedback from <ECEC staff> and parents or guardians)                     |
| SL2G11D       | Designing the <ECEC setting's> goals for children's development, well-being and learning                                                  |
| SL2G11E       | Knowledge and understanding of research and theories on pedagogy of young children                                                        |
| SL2G11F       | Using <digital resources and tools> to facilitate <ECEC setting> management (e.g. to facilitate <ECEC staff> work, to                     |

| Scale or item | Question or item wording                                                      |
|---------------|-------------------------------------------------------------------------------|
|               | communicate with parents or guardians)                                        |
| SL2G11G       | Collaborating with parents or guardians                                       |
| SL2G11H       | Collaborating with other <ECEC settings> or <ISCED 2011 level 1> schools      |
| SL2G11I       | Collaborating with community services (e.g. health services, social services) |
| SL2G11J       | Observing <ECEC staff's> practices and <ECEC staff>-child interactions        |
| SL2G11K       | Providing effective feedback to <ECEC staff>                                  |
| SL2G11O       | Promoting equity and diversity                                                |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.349. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LPDPL**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                  |               |       |       |       |
| Chile                           | 0.933            | 0.948         | 0.935 | 0.121 | 0.067 |
| Colombia                        | 0.927            | 0.950         | 0.938 | 0.107 | 0.095 |
| Denmark                         | 0.938            | 0.945         | 0.931 | 0.129 | 0.055 |
| Finland                         | 0.909            | 0.986         | 0.982 | 0.055 | 0.054 |
| Flemish Community (Belgium)     | 0.865            | 0.863         | 0.828 | 0.123 | 0.074 |
| Germany                         | 0.884            | 0.891         | 0.864 | 0.139 | 0.081 |
| Ireland                         | 0.923            | 0.927         | 0.909 | 0.120 | 0.079 |
| Israel                          | 0.938            | 0.968         | 0.952 | 0.168 | 0.054 |
| Japan                           | 0.920            | 0.961         | 0.952 | 0.083 | 0.071 |
| Morocco                         | 0.935            | 0.962         | 0.952 | 0.106 | 0.044 |
| Norway                          | 0.884            | 0.931         | 0.896 | 0.132 | 0.069 |
| New Zealand                     | 0.923            | 0.748         | 0.622 | 0.278 | 0.159 |
| Spain                           | 0.925            | 0.974         | 0.967 | 0.066 | 0.043 |
| Sweden                          | 0.912            | 0.959         | 0.949 | 0.095 | 0.062 |
| Türkiye                         | 0.951            | 0.950         | 0.938 | 0.146 | 0.066 |
| International pooled data       | 0.942            | 0.966         | 0.958 | 0.094 | 0.035 |
| U3                              |                  |               |       |       |       |
| Canada                          | 0.939            | 0.926         | 0.908 | 0.165 | 0.089 |
| Flemish Community (Belgium)     | 0.851            | 0.827         | 0.784 | 0.124 | 0.115 |
| Germany                         | 0.878            | 0.949         | 0.936 | 0.093 | 0.063 |
| Ireland                         | 0.939            | 0.950         | 0.938 | 0.114 | 0.068 |
| Israel                          | 0.949            | 0.949         | 0.924 | 0.179 | 0.103 |
| Norway                          | 0.825            | 0.961         | 0.941 | 0.129 | 0.064 |
| New Zealand                     | 0.899            | 0.752         | 0.628 | 0.449 | 0.294 |
| International pooled data       | 0.909            | 0.929         | 0.912 | 0.106 | 0.060 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.



**Table 11.350. Measurement invariance results from MGCFA for scale S2LPDPL with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |       |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|-------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.957     | 0.946 | 0.107 | 0.064 | -                       | -     | -       | -      |
| Equal loadings                | 0.956     | 0.954 | 0.098 | 0.078 | -0.001                  | 0.009 | -0.009  | 0.014  |
| Equal loadings and thresholds | 0.947     | 0.960 | 0.092 | 0.121 | -0.009                  | 0.005 | -0.006  | 0.043  |
| <b>U3</b>                     |           |       |       |       |                         |       |         |        |
| Baseline                      | 0.945     | 0.931 | 0.117 | 0.080 | -                       | -     | -       | -      |
| Equal loadings                | 0.948     | 0.945 | 0.105 | 0.093 | 0.003                   | 0.014 | -0.012  | 0.012  |
| Equal loadings and thresholds | 0.944     | 0.955 | 0.094 | 0.124 | -0.004                  | 0.010 | -0.010  | 0.032  |

Note: Japan and New Zealand are excluded from measurement invariance testing in the ISCED level 02 population; New Zealand is excluded from measurement invariance testing in the U3 population.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.351. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LPDPL**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SL2G11B | 0.591   | -1.120      | -0.065      | 1.129       |
| SL2G11C | 0.705   | -0.999      | -0.064      | 1.214       |
| SL2G11D | 0.772   | -0.992      | 0.022       | 1.177       |
| SL2G11E | 0.698   | -1.064      | -0.056      | 1.148       |
| SL2G11F | 0.539   | -0.808      | -0.002      | 0.984       |
| SL2G11G | 0.721   | -0.761      | 0.324       | 1.290       |
| SL2G11H | 0.753   | -0.676      | 0.409       | 1.374       |
| SL2G11I | 0.733   | -0.735      | 0.242       | 1.387       |
| SL2G11J | 0.755   | -0.861      | 0.106       | 1.284       |
| SL2G11K | 0.722   | -1.005      | -0.068      | 0.983       |
| SL2G11O | 0.696   | -0.799      | 0.161       | 1.367       |

Source: OECD, TALIS Starting Strong 2024 database.

### Neighbourhood environment (S2LNIGHBR)

ECEC setting leaders answered five items measuring their views on the *Neighbourhood environment* (S2LNIGHBR). These items were SL2G14A, SL2G14B, SL2G14C, SL2G14D and SL2G14F. ECEC setting leaders were asked to indicate their level of agreement with various statements about the neighbourhood in which the ECEC setting is located. Response categories included: “Strongly disagree”, “Disagree”, “Agree” and “Strongly agree”. Higher values on this scale indicate more critical, or negative, perceptions of the neighbourhood environment. Item SL2G14D was reverse coded to align with the direction of the other items in the scale, as it was the only positively worded statement. Table 11.352 provides the item names as used in the dataset, question stem and response options for the items belonging to this scale, as well as the scale mid-point.

Scale reliabilities and model fit for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.353. The reliabilities for S2LNIGHBR are above 0.700 in all populations. As shown in Table 11.353, model fit for S2LNIGHBR is acceptable across all participating countries/territories, with the CFI, TLI and SRMR all within the cut-off criteria. RMSEA values are also generally within acceptable limits, with a few exceptions: the ISCED level 02 population in Chile, Colombia and Germany,



as well as the U3 population in Ireland. In the pooled U3 model, the RMSEA exceeds the established cut-off by a small margin.

Table 11.354 presents the results from the measurement invariance testing for S2LNIGHBR for the ISCED level 02 and U3 populations. The ISCED level 02 results show an acceptable model fit for the baseline model across all fit indices. The degree of change between the baseline and the equal loadings models is within the cut-off criteria for the TLI, RMSEA, SRMR and is close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all indices. However, the equal loadings and thresholds model shows good CFI and TLI. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

For the U3 population, the baseline model also shows an acceptable model fit, with all fit indices within the cut-off criteria. The degree of change between the baseline and the equal loadings models is within the cut-off criteria for the RMSEA and SRMR, is close for the TLI, but exceeds the cut-off for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criteria for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.355 presents the standardised item loadings and thresholds based on pooled data from ISCED level 02 for the scale S2LNIGHBR. Item SL2G14D exhibits a low loading; all other items demonstrate high loadings. Results by participating country/territory also show a low loading for item SL2G14D in eight ISCED level 02 countries/territories (Colombia, Finland, Germany, Ireland, Israel, Japan, Morocco and Sweden) and five U3 countries/territories (Canada, the Flemish Community of Belgium, Germany, Ireland and Israel).

**Table 11.352. Items and response categories used in the construction of scale S2LNIGHBR**

| Scale or item | Question or item wording                                                                                                                              |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2LNIGHB      | Thinking about the neighbourhood where this <ECEC setting> is located, how strongly do you agree or disagree with the following statements?           |
|               | <i>Recoded response categories for scaling: 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree</i>                                            |
|               | Scale mid-point: 2.5                                                                                                                                  |
| SL2G14A       | There is <litter> lying around.                                                                                                                       |
| SL2G14B       | There is vandalism.                                                                                                                                   |
| SL2G14C       | People from diverse backgrounds (e.g. different ethnicity or culture, migrant background, sexual or gender minorities) experience insults or attacks. |
| SL2G14D*      | There are public places where children can play safely.                                                                                               |
| SL2G14F       | There are drug-related problems.                                                                                                                      |

Note: \* Item was reverse coded.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.353. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LNIGHBR**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                  |               |       |       |       |
| Chile                           | 0.841            | 0.971         | 0.942 | 0.144 | 0.049 |
| Colombia                        | 0.753            | 0.954         | 0.907 | 0.112 | 0.061 |
| Denmark                         | 0.818            | 0.988         | 0.977 | 0.083 | 0.039 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Finland                         | 0.837                           | 0.992         | 0.983 | 0.076        | 0.034 |
| Flemish Community (Belgium)     | 0.893                           | 0.998         | 0.997 | 0.058        | 0.025 |
| Germany                         | 0.790                           | 0.965         | 0.930 | <b>0.151</b> | 0.048 |
| Ireland                         | 0.741                           | 0.995         | 0.990 | 0.085        | 0.041 |
| Israel                          | 0.826                           | 1.000         | 1.000 | 0.000        | 0.000 |
| Japan                           | 0.831                           | 0.994         | 0.988 | 0.072        | 0.037 |
| Morocco                         | 0.797                           | 0.999         | 0.997 | 0.025        | 0.015 |
| Norway                          | 0.832                           | 1.000         | 1.000 | 0.000        | 0.000 |
| New Zealand                     | 0.891                           | 1.000         | 1.000 | 0.000        | 0.000 |
| Spain                           | 0.845                           | 0.988         | 0.976 | 0.067        | 0.030 |
| Sweden                          | 0.827                           | 1.000         | 1.003 | 0.000        | 0.013 |
| Türkiye                         | 0.835                           | 0.997         | 0.994 | 0.041        | 0.018 |
| International pooled data       | 0.828                           | 0.989         | 0.977 | 0.076        | 0.023 |
| <b>U3</b>                       |                                 |               |       |              |       |
| Canada                          | 0.823                           | 0.998         | 0.997 | 0.029        | 0.025 |
| Flemish Community (Belgium)     | 0.797                           | 0.991         | 0.982 | 0.093        | 0.032 |
| Germany                         | 0.825                           | 0.998         | 0.996 | 0.044        | 0.021 |
| Ireland                         | 0.876                           | 0.982         | 0.965 | <b>0.173</b> | 0.048 |
| Israel                          | 0.846                           | 1.000         | 1.000 | 0.000        | 0.000 |
| Norway                          | 0.709                           | 1.000         | 1.000 | 0.000        | 0.000 |
| New Zealand                     | 0.831                           | 1.000         | 1.000 | 0.000        | 0.000 |
| International pooled data       | 0.824                           | 0.980         | 0.961 | <b>0.114</b> | 0.032 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.354. Measurement invariance results from MGCFA for scale S2LNIGHBR with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.988     | 0.977 | 0.092 | 0.035 | -                       | -      | -       | -      |
| Equal loadings                | 0.980     | 0.976 | 0.092 | 0.059 | -0.009                  | -0.000 | 0.000   | 0.024  |
| Equal loadings and thresholds | 0.909     | 0.946 | 0.140 | 0.171 | -0.071                  | -0.030 | 0.047   | 0.112  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.994     | 0.987 | 0.084 | 0.029 | -                       | -      | -       | -      |
| Equal loadings                | 0.983     | 0.979 | 0.107 | 0.056 | -0.011                  | -0.008 | 0.023   | 0.027  |
| Equal loadings and thresholds | 0.969     | 0.980 | 0.105 | 0.147 | -0.014                  | 0.001  | -0.002  | 0.090  |

Note: Japan and New Zealand are excluded from measurement invariance testing in the ISCED level 02 population; Norway and New Zealand are excluded from measurement invariance testing in the U3 population.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.355. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LNIGHBR**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SL2G14A | 0.802   | -0.432      | 0.670       | 1.565       |
| SL2G14B | 0.912   | -0.501      | 0.643       | 1.534       |
| SL2G14C | 0.736   | -0.294      | 0.907       | 1.626       |
| SL2G14D | 0.365   | -0.392      | 0.892       | 1.479       |
| SL2G14F | 0.719   | -0.641      | 0.429       | 1.393       |

Source: OECD, TALIS Starting Strong 2024 database.

### **Structural quality: adequacy of setting (S2LSQSET)**

The scale of *Structural quality: adequacy of setting* (S2LSQSET) was constructed using seven items (SL2G28A, SL2G28B, SL2G28C, SL2G28D, SL2G28E, SL2G28F and SL2G28G). These items measured ECEC setting leaders' agreement with different statements about the physical space at their ECEC setting. The response options available were: "Strongly disagree", "Disagree", "Agree" and "Strongly agree". Due to limited variability in responses, the categories "Strongly disagree" and "Disagree" were collapsed into a single category for scaling purposes. Higher scores on this scale indicate more positive perceptions of the physical adequacy of the ECEC setting. Table 11.356 provides the item names as used in the dataset, question stem and response options for the items belonging to this scale, as well as the scale mid-point.

Scale reliabilities and model fit for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.357. The reliabilities for S2LSQSET are high, above 0.800, in all populations. The S2LSQSET scale has a generally acceptable model fit across all participating countries/territories, with the CFI, TLI and SRMR within the cut-off criteria. The only exception for the TLI is the U3 population in New Zealand. RMSEA values exceed the cut-off in one-third of the ISCED level 02 population (in Colombia, Israel, Morocco, New Zealand and Norway), as well as in the U3 population in Israel and New Zealand.

Table 11.358 presents the results from the measurement invariance testing for S2LSQSET for the ISCED level 02 and U3 populations. The baseline models show an acceptable model fit based on all indices for both populations. The degree of change between the baseline and the equal loadings models is within the cut-off criteria for all model fit indices for both populations. For ISCED level 02, the degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all fit indices. The equal loadings and thresholds model shows good CFI and TLI, but the RMSEA and SRMR considerably exceed the cut-off. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

For U3, the degree of change between the equal loadings and the equal loadings and thresholds models also exceeds the cut-off criteria for all fit indices, although to a lesser extent. Furthermore, the equal loadings and thresholds models show good CFI, TLI and a close-to-acceptable RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.359 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LSQSET. All item loadings are high for the pooled model, as well as in single countries/territories.

**Table 11.356. Items and response categories used in the construction of scale S2LSQSET**

| Scale or item | Question or item wording                                                                                                                                                                                                 |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2LSQSET      | To what extent do you agree with the following statements about the physical space at this <ECEC setting>?<br><i>Recoded response categories for scaling: 1=Strongly disagree or disagree; 2=Agree; 3=Strongly agree</i> |

| Scale or item | Question or item wording                                                                            |
|---------------|-----------------------------------------------------------------------------------------------------|
|               | Scale mid-point: 2                                                                                  |
| SL2G28A       | There is adequate ventilation for healthy airflow.                                                  |
| SL2G28B       | There is an adequate amount of furniture for each child (e.g. chairs, tables).                      |
| SL2G28C       | Indoor space is arranged so that children can easily move around.                                   |
| SL2G28D       | The background noise level in the <classroom/playgroup/group> does not interfere with interactions. |
| SL2G28E       | The roof, ceiling, walls and floor are in good shape (e.g. have no leaks, mould).                   |
| SL2G28F       | Children can access a bathroom easily.                                                              |
| SL2G28G       | Outdoor space is arranged so that children can easily move around.                                  |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.357. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LSQSET**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |              |              |       |
| Chile                           | 0.935            | 0.990         | 0.985        | 0.082        | 0.042 |
| Colombia                        | 0.911            | 0.972         | 0.958        | <b>0.135</b> | 0.059 |
| Denmark                         | 0.887            | 0.998         | 0.997        | 0.024        | 0.042 |
| Finland                         | 0.880            | 0.976         | 0.964        | 0.075        | 0.071 |
| Flemish Community (Belgium)     | 0.902            | 0.992         | 0.987        | 0.053        | 0.044 |
| Germany                         | 0.820            | 0.965         | 0.948        | 0.061        | 0.068 |
| Ireland                         | 0.965            | 1.000         | 1.002        | 0.000        | 0.026 |
| Israel                          | 0.903            | 0.986         | 0.957        | <b>0.134</b> | 0.027 |
| Japan                           | 0.940            | 0.992         | 0.988        | 0.057        | 0.035 |
| Morocco                         | 0.938            | 0.984         | 0.975        | <b>0.128</b> | 0.035 |
| Norway                          | 0.888            | 0.997         | 0.991        | <b>0.143</b> | 0.024 |
| New Zealand                     | 0.895            | 0.981         | 0.942        | <b>0.199</b> | 0.055 |
| Spain                           | 0.913            | 0.982         | 0.973        | 0.067        | 0.041 |
| Sweden                          | 0.904            | 0.976         | 0.965        | 0.093        | 0.081 |
| Türkiye                         | 0.961            | 0.992         | 0.988        | 0.098        | 0.021 |
| International pooled data       | 0.910            | 0.980         | 0.970        | 0.073        | 0.037 |
| U3                              |                  |               |              |              |       |
| Canada                          | 0.942            | 0.989         | 0.983        | 0.091        | 0.040 |
| Flemish Community (Belgium)     | 0.908            | 0.987         | 0.981        | 0.066        | 0.062 |
| Germany                         | 0.845            | 0.999         | 0.998        | 0.014        | 0.052 |
| Ireland                         | 0.955            | 0.993         | 0.989        | 0.066        | 0.035 |
| Israel                          | 0.910            | 0.987         | 0.961        | <b>0.140</b> | 0.040 |
| Norway                          | 0.876            | 1.000         | 1.014        | 0.000        | 0.016 |
| New Zealand                     | 0.973            | 0.918         | <b>0.754</b> | <b>0.400</b> | 0.084 |
| International pooled data       | 0.913            | 0.977         | 0.966        | 0.068        | 0.052 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.358. Measurement invariance results from MGCFA for scale S2LSQSET with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.990     | 0.985 | 0.081 | 0.044 | -                       | -      | -       | -      |
| Equal loadings                | 0.987     | 0.986 | 0.078 | 0.065 | -0.003                  | 0.001  | -0.003  | 0.022  |
| Equal loadings and thresholds | 0.952     | 0.960 | 0.130 | 0.163 | -0.034                  | -0.026 | 0.052   | 0.097  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.986     | 0.978 | 0.084 | 0.052 | -                       | -      | -       | -      |
| Equal loadings                | 0.985     | 0.983 | 0.075 | 0.071 | -0.001                  | 0.004  | -0.009  | 0.020  |
| Equal loadings and thresholds | 0.964     | 0.968 | 0.103 | 0.139 | -0.021                  | -0.015 | 0.028   | 0.068  |

Note: New Zealand and Sweden are excluded from measurement invariance testing in the ISCED level 02 population; New Zealand is excluded from measurement invariance testing in the U3 population.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.359. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LSQSET**

| Item    | Loading | Threshold 1 | Threshold 2 |
|---------|---------|-------------|-------------|
| SL2G28A | 0.694   | -1.068      | 0.028       |
| SL2G28B | 0.849   | -1.550      | -0.383      |
| SL2G28C | 0.843   | -1.380      | -0.097      |
| SL2G28D | 0.626   | -0.592      | 0.519       |
| SL2G28E | 0.757   | -0.815      | 0.066       |
| SL2G28F | 0.834   | -1.498      | -0.304      |
| SL2G28G | 0.802   | -1.441      | -0.293      |

Source: OECD, TALIS Starting Strong 2024 database.

### Barriers to structural quality: adequacy of physical resources (S2LSQPRS)

As part of the assessment of structural quality, ECEC setting leaders were also asked to indicate the extent to which different factors hinder ECEC setting's ability to provide a quality environment for children. Four of these items (SL2G42A, SL2G42B, SL2G42C and SL2G42D) were used to construct the scale *Barriers to structural quality: adequacy of physical resources* (S2LSQPRS). The response categories available included: "Not at all", "To some extent", "Quite a bit" and "A lot". Due to limited variability in responses, the categories "Quite a bit" and "A lot" were collapsed into a single category for scaling purposes. Higher scores on this scale indicate greater perceived barriers to structural quality related to the adequacy of physical resources. Table 11.360 provides the item names as used in the dataset, question stem and response options for the items belonging to this scale, as well as the scale mid-point.

Scale reliabilities and model fit for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.361. The reliabilities for S2LSQPRS are within the cut-off criterion in all populations. As shown in Table 11.361, the S2LSQPRS scale shows a generally acceptable model fit across all participating countries/territories. For the ISCED level 02 population, the CFI and TLI do not meet the cut-off criteria only in the Flemish Community of Belgium, while RMSEA values exceed the cut-off also in the Flemish Community of Belgium, as well as in Chile, Colombia, Denmark, Morocco and Spain. The SRMR is within the cut-off criterion across all ISCED level 02 participating countries/territories. For the U3 population, the CFI, TLI, RMSEA and SRMR are all within the cut-off criteria. Based on the single CFA model fit results, the scale S2LSQPRS works well across all populations except in the Flemish

Community of Belgium (ISCED level 02), where the CFI, TLI and RMSEA do not meet the acceptable cut-off criteria.

Table 11.362 presents the results from the measurement invariance testing for S2LSQPRS for the ISCED level 02 and U3 populations. For the ISCED level 02 population, the baseline model shows an acceptable model fit based on the CFI, TLI, SRMR and is very close to the acceptable cut-off for the RMSEA. The degree of change between the baseline and the equal loadings models is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is close to the cut-off criteria for the TLI and RMSEA and exceeds the cut-offs for the CFI and SRMR. However, the equal loadings and thresholds model shows good CFI and TLI, with close-to-acceptable RMSEA and SRMR. No special caution is required when comparing scale score results across countries/territories.

For the U3 population, the baseline model also shows an acceptable model fit based on all fit indices. The degree of change between the baseline and the equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-offs for the CFI and TLI, very close for the RMSEA, but exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.363 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LSQPRS. All items show high loadings. Results by participating country/territory show a low loading for item SL2G42D in Finland, Germany and Ireland (all ISCED level 02), as well as for item SL2G42C in the Flemish Community of Belgium (ISCED level 02).

**Table 11.360. Items and response categories used in the construction of scale S2LSQPRS**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                                            |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2LSQPRS      | To what extent do the following issues hinder this <ECEC setting's> capacity to provide a quality environment for development, well-being and learning of children?<br><i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit or a lot</i><br>Scale mid-point: 2 |
| SL2G42A       | Shortage or inadequacy of play or learning materials (e.g. picture books, building blocks, paint)                                                                                                                                                                                                   |
| SL2G42B       | Shortage or inadequacy of indoor space                                                                                                                                                                                                                                                              |
| SL2G42C       | Shortage or inadequacy of outdoor play space                                                                                                                                                                                                                                                        |
| SL2G42D       | Shortage or inadequacy of <digital resources and tools>                                                                                                                                                                                                                                             |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.361. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LSQPRS**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| ISCED level 02                  |                  |               |              |              |       |
| Chile                           | 0.898            | 0.981         | 0.943        | <b>0.202</b> | 0.054 |
| Colombia                        | 0.847            | 0.969         | 0.907        | <b>0.162</b> | 0.078 |
| Denmark                         | 0.782            | 0.969         | 0.907        | <b>0.143</b> | 0.051 |
| Finland                         | 0.661            | 1.000         | 1.100        | 0.000        | 0.012 |
| Flemish Community (Belgium)     | 0.667            | <b>0.872</b>  | <b>0.616</b> | <b>0.164</b> | 0.064 |
| Germany                         | 0.756            | 1.000         | 1.033        | 0.000        | 0.011 |
| Ireland                         | 0.773            | 0.990         | 0.970        | 0.070        | 0.037 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |              |       |
|---------------------------------|---------------------------------|---------------|-------|--------------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA        | SRMR  |
| Israel                          | 0.907                           | 1.000         | 1.000 | 0.000        | 0.000 |
| Japan                           | 0.762                           | 0.997         | 0.992 | 0.033        | 0.027 |
| Morocco                         | 0.885                           | 0.987         | 0.962 | <b>0.153</b> | 0.038 |
| Norway                          | 0.789                           | 1.000         | 1.000 | 0.000        | 0.000 |
| New Zealand                     | 0.698                           | 1.000         | 1.000 | 0.000        | 0.000 |
| Spain                           | 0.860                           | 0.984         | 0.953 | <b>0.115</b> | 0.039 |
| Sweden                          | 0.814                           | 1.000         | 1.011 | 0.000        | 0.025 |
| Türkiye                         | 0.942                           | 1.000         | 0.999 | 0.039        | 0.010 |
| International pooled data       | 0.873                           | 0.989         | 0.967 | 0.096        | 0.029 |
| <b>U3</b>                       |                                 |               |       |              |       |
| Canada                          | 0.854                           | 1.000         | 1.003 | 0.000        | 0.030 |
| Flemish Community (Belgium)     | 0.832                           | 0.998         | 0.994 | 0.038        | 0.045 |
| Germany                         | 0.795                           | 0.995         | 0.986 | 0.061        | 0.024 |
| Ireland                         | 0.812                           | 1.000         | 1.020 | 0.000        | 0.015 |
| Israel                          | 0.925                           | 1.000         | 1.000 | 0.000        | 0.000 |
| Norway                          | 0.651                           | 1.000         | 1.000 | 0.000        | 0.000 |
| New Zealand                     | 0.609                           | 1.000         | 1.000 | 0.000        | 0.000 |
| International pooled data       | 0.840                           | 1.000         | 0.999 | 0.017        | 0.013 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.362. Measurement invariance results from MGCFA for scale S2LSQPRS with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.993     | 0.979 | 0.111 | 0.035 | -                       | -      | -       | -      |
| Equal loadings                | 0.989     | 0.987 | 0.089 | 0.059 | -0.004                  | 0.007  | -0.022  | 0.024  |
| Equal loadings and thresholds | 0.971     | 0.977 | 0.118 | 0.115 | -0.019                  | -0.010 | 0.029   | 0.056  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.007 | 0.025 | -                       | -      | -       | -      |
| Equal loadings                | 0.999     | 0.999 | 0.039 | 0.051 | -0.001                  | -0.001 | 0.032   | 0.027  |
| Equal loadings and thresholds | 0.998     | 0.998 | 0.059 | 0.092 | -0.001                  | -0.001 | 0.020   | 0.040  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.363. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LSQPRS**

| Item    | Loading | Threshold 1 | Threshold 2 |
|---------|---------|-------------|-------------|
| SL2G42A | 0.829   | 0.011       | 0.871       |
| SL2G42B | 0.838   | -0.215      | 0.725       |
| SL2G42C | 0.820   | 0.007       | 0.748       |
| SL2G42D | 0.679   | -0.382      | 0.591       |

Source: OECD, TALIS Starting Strong 2024 database.



### Barriers to structural quality: adequacy of staffing (ISCED 02 only) (S2LSQSTA)

The scale of *Barriers to structural quality: adequacy of staffing* (S2LSQSTA) was constructed using seven items (SL2G42I, SL2G42J, SL2G42K, SL2G42L, SL2G42M, SL2G42N and SL2G42O). ECEC setting leaders were asked to indicate the extent to which each item hinders the setting's ability to provide a quality environment for children. Response options available were: "Not at all", "To some extent", "Quite a bit" and "A lot". Higher scores on this scale reflect greater perceived barriers to structural quality in relation to staffing adequacy. Table 11.364 provides the item names as used in the dataset, question stem and response options for the items belonging to this scale, as well as the scale mid-point. The scale S2LSQSTA is only available for the ISCED level 02 population.

Scale reliabilities and model fit for all populations, as well as for the pooled models for ISCED level 02 are presented in Table 11.365. The reliabilities for S2LSQSTA are high, generally above 0.800, across all populations. In terms of model fit, the CFI values for S2LSQSTA are generally acceptable across all participating countries/territories, except in New Zealand and Norway. The TLI also falls below the acceptable cut-off in these two populations. The RMSEA exceeds the cut-off in several populations, particularly in the Flemish Community of Belgium, Germany, Ireland and New Zealand, where it is above 0.140. SRMR values are within the cut-off criterion for all populations except for New Zealand. Based on the single CFA model fit results, the scale S2LSQSTA works well across all countries/territories except in New Zealand, where the CFI, TLI, RMSEA and SRMR do not meet the acceptable cut-off criteria.

Table 11.366 presents the results from the measurement invariance testing for S2LSQSTA for the ISCED level 02 population. The results show an acceptable model fit for the baseline model across all fit indices. The degree of change between the baseline and the equal loadings models is within the cut-off criteria for the TLI, RMSEA, SRMR and is very close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-offs for all fit indices. However, the equal loadings and thresholds model shows acceptable CFI and TLI, although the RMSEA and SRMR considerably exceed the cut-off. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

Table 11.367 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LSQSTA. All item loadings are high. Results by participating country/territory show a low loading for item SL2G42M in Colombia.

**Table 11.364. Items and response categories used in the construction of scale S2LSQSTA**

| Scale or item | Question or item wording                                                                                                                                                                                                                                                                              |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2LSQSTA      | To what extent do the following issues hinder this <ECEC setting's> capacity to provide a quality environment for development, well-being and learning of children?<br><i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i><br>Scale mid-point: 2.5 |
| SL2G42I       | <ECEC staff> absences                                                                                                                                                                                                                                                                                 |
| SL2G42J       | Lack of opportunities or support for <ECEC staff's> professional development                                                                                                                                                                                                                          |
| SL2G42K       | Shortage of <ECEC staff> with competence in working with children from <socio-economically disadvantaged homes>                                                                                                                                                                                       |
| SL2G42L       | Shortage of <ECEC staff> with competence in working with children with special education needs                                                                                                                                                                                                        |
| SL2G42M       | Shortage of <ECEC staff> with competence in working with children speaking another language than the language(s) used in the <ECEC setting>                                                                                                                                                           |
| SL2G42N       | Shortage of qualified staff                                                                                                                                                                                                                                                                           |
| SL2G42O       | Shortage of staff for the number of enrolled children                                                                                                                                                                                                                                                 |

Source: OECD, TALIS Starting Strong 2024 database.



**Table 11.365. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LSQSTA**

| Participating country/territory | Reliability      | CFA model fit |              |              |              |
|---------------------------------|------------------|---------------|--------------|--------------|--------------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR         |
| ISCED level 02                  |                  |               |              |              |              |
| Chile                           | 0.910            | 0.977         | 0.965        | <b>0.109</b> | 0.057        |
| Colombia                        | 0.905            | 1.000         | 1.005        | 0.000        | 0.034        |
| Denmark                         | 0.875            | 0.978         | 0.967        | <b>0.102</b> | 0.049        |
| Finland                         | 0.904            | 0.982         | 0.973        | 0.082        | 0.055        |
| Flemish Community (Belgium)     | 0.884            | 0.935         | 0.903        | <b>0.173</b> | 0.066        |
| Germany                         | 0.868            | 0.940         | 0.911        | <b>0.148</b> | 0.062        |
| Ireland                         | 0.897            | 0.945         | 0.918        | <b>0.140</b> | 0.084        |
| Israel                          | 0.923            | 0.968         | 0.952        | <b>0.168</b> | 0.054        |
| Japan                           | 0.828            | 0.946         | 0.919        | 0.097        | 0.061        |
| Morocco                         | 0.918            | 0.976         | 0.963        | <b>0.123</b> | 0.047        |
| Norway                          | 0.840            | <b>0.885</b>  | <b>0.769</b> | 0.070        | 0.048        |
| New Zealand                     | 0.773            | <b>0.663</b>  | <b>0.327</b> | <b>0.257</b> | <b>0.225</b> |
| Spain                           | 0.927            | 0.998         | 0.997        | 0.027        | 0.020        |
| Sweden                          | 0.844            | 0.973         | 0.960        | 0.082        | 0.055        |
| Türkiye                         | 0.954            | 0.993         | 0.989        | <b>0.104</b> | 0.025        |
| International pooled data       | 0.891            | 0.978         | 0.967        | 0.077        | 0.030        |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 model.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.366. Measurement invariance results from MGCFA for scale S2LSQSTA with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.979     | 0.969 | 0.109 | 0.051 | -                       | -      | -       | -      |
| Equal loadings                | 0.973     | 0.971 | 0.105 | 0.074 | -0.006                  | 0.003  | -0.005  | 0.022  |
| Equal loadings and thresholds | 0.914     | 0.942 | 0.148 | 0.192 | -0.060                  | -0.029 | 0.044   | 0.119  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 population.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.367. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LSQSTA**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SL2G42I | 0.663   | -0.594      | 0.323       | 1.015       |
| SL2G42J | 0.712   | -0.441      | 0.659       | 1.415       |
| SL2G42K | 0.869   | -0.181      | 0.757       | 1.396       |
| SL2G42L | 0.816   | -0.587      | 0.405       | 1.155       |
| SL2G42M | 0.669   | -0.230      | 0.663       | 1.371       |

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SL2G42N | 0.799   | -0.283      | 0.587       | 1.135       |
| SL2G42O | 0.679   | -0.115      | 0.606       | 1.126       |

Source: OECD, TALIS Starting Strong 2024 database.

### Leader support for staff in pedagogical learning (S2LEADSPL1)

The scale of *Leader support for staff in pedagogical learning* (S2LEADSPL1) was measured using four items (SL2G32A, SL2G32B, SL2G32C and SL2G32D), in which ECEC setting leaders reported how often they engaged in various leadership activities over the past year. Response options included: “Never”, “Less than monthly”, “Monthly”, “Weekly” and “Daily”. Due to limited variability in responses, the categories “Never” and “Less than monthly” were collapsed into a single category for scaling purposes. Higher scores on this scale indicate more frequent leadership practices aimed at supporting the pedagogical learning of ECEC staff. Table 11.368 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.369. The reliabilities for S2LEADSPL1 are acceptable in all populations. As shown in Table 11.369, the CFI values for S2LEADSPL1 are within the cut-off criterion across all participating countries/territories, except for the ISCED level 02 population in Norway. The TLI is also within the acceptable cut-off criterion for most populations, except in the ISCED level 02 population in the Flemish Community of Belgium and Germany, as well as in the U3 population in Germany and Norway. The SRMR exceeds the cut-off only in the U3 population in Norway. The RMSEA exceeds the cut-off in most participating countries/territories, particularly in the ISCED level 02 population in Germany, Ireland, Israel and Norway, where it is above 0.160; and in the U3 population in Germany, Ireland, New Zealand and Norway, where it is also above 0.160. The RMSEA values for the two pooled models also exceed the cut-off criterion, but only marginally so for the U3 population. Based on the single CFA model fit results, the scale S2LEADSPL1 works well across all populations except in Norway (U3), where the CFI, TLI, RMSEA and SRMR do not meet the acceptable cut-off criteria.

Table 11.370 presents the results from the measurement invariance testing for S2LEADSPL1 for the ISCED level 02 and U3 populations. The ISCED level 02 results show an acceptable model fit for the baseline model based on the CFI, TLI and SRMR. The degree of change between the baseline and the equal loadings models is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is very close to the cut-off criteria for the TLI and RMSEA and exceeds the cut-offs for the CFI and SRMR. However, the equal loadings and thresholds model shows at least acceptable CFI and TLI. No special caution is required when comparing scale score results across countries/territories.

For the U3 population, the baseline model shows an acceptable fit based on the CFI, TLI and SRMR, but exceeds the cut-off for the RMSEA. The degree of change between the baseline and the equal loadings models is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criteria for the CFI, TLI and RMSEA but exceeds the cut-off for the SRMR. No special caution is required when comparing scale score results across countries/territories.

Table 11.371 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LEADSPL1. All item loadings are high. Results by participating country/territory show a low loading for items SL2G32A and SL2G32D in the Flemish Community of Belgium (ISCED level 02).

**Table 11.368. Items and response categories used in the construction of scale S2LEADSPL1**

| Scale or item | Question or item wording                                                                                                 |
|---------------|--------------------------------------------------------------------------------------------------------------------------|
| S2LEADSPL1    | Please indicate how frequently you engaged in the following activities in this <ECEC setting> during the last 12 months. |
|               | <i>Recoded response categories for scaling: 1=Never or less than monthly; 2=Monthly; 3=Weekly; 4=Daily</i>               |
|               | Scale mid-point: 2.5                                                                                                     |
| SL2G32A       | I collaborated with <ECEC staff> to improve how children play together.                                                  |
| SL2G32B       | I observed <ECEC staff> practices and staff-child interactions.                                                          |
| SL2G32C       | I provided feedback to <ECEC staff> based on my observations.                                                            |
| SL2G32D       | I took actions to support co-operation among <ECEC staff> to develop new approaches to ECEC practices.                   |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.369. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LEADSPL1**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                  |               |       |       |       |
| Chile                           | 0.845            | 0.988         | 0.964 | 0.116 | 0.025 |
| Colombia                        | 0.948            | 1.000         | 0.999 | 0.036 | 0.013 |
| Denmark                         | 0.792            | 0.985         | 0.954 | 0.129 | 0.042 |
| Finland                         | 0.787            | 0.995         | 0.985 | 0.058 | 0.023 |
| Flemish Community (Belgium)     | 0.622            | 0.955         | 0.866 | 0.133 | 0.050 |
| Germany                         | 0.782            | 0.907         | 0.720 | 0.287 | 0.065 |
| Ireland                         | 0.871            | 0.981         | 0.943 | 0.197 | 0.043 |
| Israel                          | 0.796            | 0.960         | 0.921 | 0.171 | 0.046 |
| Japan                           | 0.815            | 0.997         | 0.991 | 0.046 | 0.023 |
| Morocco                         | 0.876            | 0.993         | 0.979 | 0.114 | 0.021 |
| Norway                          | 0.789            | 0.981         | 0.963 | 0.160 | 0.048 |
| New Zealand                     | 0.781            | 1.000         | 1.007 | 0.000 | 0.035 |
| Spain                           | 0.817            | 0.979         | 0.936 | 0.119 | 0.034 |
| Sweden                          | 0.815            | 0.989         | 0.967 | 0.122 | 0.033 |
| Türkiye                         | 0.941            | 0.999         | 0.996 | 0.098 | 0.011 |
| International pooled data       | 0.862            | 0.985         | 0.956 | 0.127 | 0.026 |
| U3                              |                  |               |       |       |       |
| Canada                          | 0.839            | 1.000         | 1.007 | 0.000 | 0.012 |
| Flemish Community (Belgium)     | 0.955            | 0.998         | 0.995 | 0.142 | 0.016 |
| Germany                         | 0.787            | 0.960         | 0.881 | 0.200 | 0.049 |
| Ireland                         | 0.858            | 0.975         | 0.924 | 0.182 | 0.049 |
| Israel                          | 0.862            | 0.999         | 0.998 | 0.032 | 0.022 |
| Norway                          | 0.770            | 0.836         | 0.672 | 0.317 | 0.114 |
| New Zealand                     | 0.882            | 0.995         | 0.990 | 0.190 | 0.074 |
| International pooled data       | 0.888            | 0.993         | 0.978 | 0.103 | 0.021 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.370. Measurement invariance results from MGCFA for scale S2LEADSPL1 with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.992     | 0.975 | 0.126 | 0.032 | -                       | -      | -       | -      |
| Equal loadings                | 0.981     | 0.977 | 0.123 | 0.053 | -0.010                  | 0.001  | -0.003  | 0.022  |
| Equal loadings and thresholds | 0.945     | 0.970 | 0.139 | 0.152 | -0.037                  | -0.006 | 0.015   | 0.099  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.992     | 0.976 | 0.156 | 0.034 | -                       | -      | -       | -      |
| Equal loadings                | 0.992     | 0.988 | 0.110 | 0.045 | -0.001                  | 0.012  | -0.047  | 0.011  |
| Equal loadings and thresholds | 0.988     | 0.993 | 0.085 | 0.094 | -0.003                  | 0.005  | -0.025  | 0.049  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 and U3 populations.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.371. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LEADSPL1**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SL2G32A | 0.791   | -0.519      | 0.152       | 0.816       |
| SL2G32B | 0.851   | -0.855      | -0.236      | 0.466       |
| SL2G32C | 0.846   | -0.641      | 0.194       | 1.064       |
| SL2G32D | 0.670   | -0.513      | 0.506       | 1.355       |

Source: OECD, TALIS Starting Strong 2024 database.

### Leader innovations in the ECEC setting (S2LEADSPL2)

The scale of *Leader innovations in the ECEC setting* (S2LEADSPL2) was measured using three items (SL2G32F, SL2G32G and SL2G32H), in which ECEC setting leaders reported how often they engaged in various leadership activities over the past year. Response options included: “Never”, “Less than monthly”, “Monthly”, “Weekly” and “Daily”. Higher scores on this scale reflect a greater frequency of innovative leadership practices within the ECEC setting.

Table 11.372 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.373. The model fit indices for the S2LEADSPL2 scale are not presented here as the scale was measured by just three items, resulting in a model that is just identified and therefore shows a perfect fit. The reliabilities for S2LEADSPL2 are generally acceptable across all participating countries/territories, except for the ISCED level 02 and U3 populations in Germany.

Table 11.374 presents the results from the measurement invariance testing for S2LEADSPL2 for the ISCED level 02 and U3 populations. As this is a three-item scale, the baseline model has a perfect fit because it is just identified. In the equal loadings model, all fit indices are within the cut-off criteria for both populations. For ISCED level 02, the degree of change between the equal loadings and the equal thresholds and loadings models is within the cut-off criterion for the RMSEA but exceeds the cut-offs for the CFI, TLI and SRMR. No special caution is required when comparing scale score results across countries/territories.

For U3, the degree of change between the equal loadings and the equal thresholds and loadings models is within the cut-off criteria for the TLI and RMSEA. No special caution is required when comparing scale score results across countries/territories.

Table 11.375 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LEADSPL2. All item loadings are high. Results by participating country/territory show a low loading for items SL2G32F and SL2G32H in Germany (ISCED level 02).

**Table 11.372. Items and response categories used in the construction of scale S2LEADSPL2**

| Scale or item | Question or item wording                                                                                                 |
|---------------|--------------------------------------------------------------------------------------------------------------------------|
| S2LEADSPL2    | Please indicate how frequently you engaged in the following activities in this <ECEC setting> during the last 12 months. |
|               | <i>Recoded response categories for scaling: 1=Never; 2=Less than monthly; 3=Monthly; 4=Weekly; 5=Daily</i>               |
|               | Scale mid-point: 3                                                                                                       |
| SL2G32F       | I worked on developing, revising or communicating a <vision> for this <ECEC setting>.                                    |
| SL2G32G       | I made changes in <ECEC setting> policies or practices based on monitoring results and external evaluation.              |
| SL2G32H       | I facilitated improvements in the indoor or outdoor space used for children's development, well-being and learning.      |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.373. Reliability coefficient alpha for single countries/territories and pooled model for scale S2LEADSPL2**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 02</b>           |                                 |
| Chile                           | 0.775                           |
| Colombia                        | 0.887                           |
| Denmark                         | 0.652                           |
| Finland                         | 0.821                           |
| Flemish Community (Belgium)     | 0.745                           |
| Germany                         | <b>0.552</b>                    |
| Ireland                         | 0.877                           |
| Israel                          | 0.676                           |
| Japan                           | 0.734                           |
| Morocco                         | 0.770                           |
| Norway                          | 0.613                           |
| New Zealand                     | 0.634                           |
| Spain                           | 0.742                           |
| Sweden                          | 0.685                           |
| Türkiye                         | 0.856                           |
| International pooled data       | 0.770                           |
| <b>U3</b>                       |                                 |
| Canada                          | 0.763                           |
| Flemish Community (Belgium)     | 0.743                           |
| Germany                         | <b>0.578</b>                    |
| Ireland                         | 0.791                           |

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| Israel                          | 0.830                           |
| Norway                          | 0.740                           |
| New Zealand                     | 0.829                           |
| International pooled data       | 0.808                           |

Note: Coefficients in **bold** exceed the cut-off criterion. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.374. Measurement invariance results from MGCFA for scale S2LEADSPL2 with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.995     | 0.992 | 0.065 | 0.020 | -0.005                  | -0.008 | 0.065   | 0.020  |
| Equal loadings and thresholds | 0.928     | 0.976 | 0.108 | 0.135 | -0.067                  | -0.015 | 0.043   | 0.115  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.995     | 0.990 | 0.063 | 0.020 | -0.005                  | -0.010 | 0.063   | 0.020  |
| Equal loadings and thresholds | 0.964     | 0.987 | 0.073 | 0.110 | -0.031                  | -0.004 | 0.011   | 0.089  |

Note: Denmark, New Zealand and Norway are excluded from measurement invariance testing in the ISCED level 02 population; New Zealand and Norway are excluded from measurement invariance testing in the U3 population.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.375. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LEADSPL2**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 | Threshold 4 |
|---------|---------|-------------|-------------|-------------|-------------|
| SL2G32F | 0.723   | -1.581      | -0.222      | 0.699       | 1.349       |
| SL2G32G | 0.817   | -0.967      | 0.395       | 1.240       | 1.759       |
| SL2G32H | 0.664   | -1.493      | -0.113      | 0.769       | 1.308       |

Source: OECD, TALIS Starting Strong 2024 database.

### **Distributed leadership (S2LDLEAD)**

The scale *Distributed leadership* (S2LDLEAD) was measured using six items (SL2G41A, SL2G41B, SL2G41C, SL2G41D, SL2G41F and SL2G41G) that assessed the extent to which various statements about shared leadership applied to the ECEC setting. For each item, ECEC leaders could select one of the following response options: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Due to limited variability in responses, the categories “Not at all” and “To some extent” were collapsed into a single category for scaling purposes. Higher scores in this scale indicate greater perceived distributed leadership within the ECEC setting. Table 11.376 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.377. The reliabilities for S2LDLEAD are high, generally above 0.800, in all populations. In terms of model fit, the CFI is within the cut-off criterion for most participating

countries/territories, except for the ISCED level 02 population in Colombia, Finland and Ireland. The TLI falls below the cut-off in the ISCED level 02 population in Colombia, Denmark, Finland, the Flemish Community of Belgium, Germany and Ireland. The SRMR falls within the acceptable cut-off criterion for most populations, except for the ISCED level 02 population in Colombia and Ireland. The RMSEA exceeds the cut-off in several populations, particularly in the ISCED level 02 population in Chile, Colombia, Germany, Ireland, Morocco and Norway, as well as in the U3 population in Israel and Norway. In all of these instances, the RMSEA is above 0.130. Based on the single CFA model fit results, the scale S2LDLEAD works well across all populations except in Finland (ISCED level 02), where the CFI, TLI and RMSEA do not meet the acceptable cut-off criteria, as well as in the ISCED level 02 population in Colombia and Ireland, where none of the model fit indices meet the acceptable cut-off criteria.

Table 11.378 presents the results from the measurement invariance testing for S2LDLEAD for the ISCED level 02 and U3 populations. For ISCED level 02, the baseline model shows an acceptable model fit based on the CFI, TLI, SRMR, but exceeds the cut-off for the RMSEA. The degree of change between the baseline and the equal loadings models is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all indices. Furthermore, the equal loadings and thresholds model shows a poor model fit. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

For the U3 population, the baseline model shows an acceptable model fit based on all fit indices. The degree of change between the baseline and the equal loadings model is within the cut-off criteria also for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all indices. The equal loadings and thresholds model shows a poor model fit. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.379 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LDLEAD. All item loadings are high. Results by participating country/territory show a low loading for item SL2G41B in Denmark and Germany (both ISCED level 02).

**Table 11.376. Items and response categories used in the construction of scale S2LDLEAD**

| Scale or item | Question or item wording                                                                               |
|---------------|--------------------------------------------------------------------------------------------------------|
| S2LDLEAD2     | To what extent do the following statements apply to this <ECEC setting>?                               |
|               | <i>Recoded response categories for scaling: 1=Not at all or to some extent; 2=Quite a bit; 3=A lot</i> |
|               | Scale mid-point: 2                                                                                     |
| SL2G41A       | <ECEC staff> have opportunities to actively participate in <ECEC setting> decisions.                   |
| SL2G41B       | Parents or guardians have opportunities to actively participate in <ECEC setting> decisions.           |
| SL2G41C       | Children have opportunities to actively participate in decisions.                                      |
| SL2G41D       | There is a culture of shared responsibility for <ECEC setting> issues.                                 |
| SL2G41F       | There is a collaborative <ECEC setting> culture which is characterised by mutual support.              |
| SL2G41G       | This <ECEC setting> encourages staff to lead new initiatives.                                          |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.377. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LDLEAD**

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |       |       |
|---------------------------------|---------------------------------|---------------|-------|-------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                                 |               |       |       |       |
| Chile                           | 0.918                           | 0.965         | 0.941 | 0.168 | 0.078 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |              |              |              |
|---------------------------------|---------------------------------|---------------|--------------|--------------|--------------|
|                                 |                                 | CFI           | TLI          | RMSEA        | SRMR         |
| Colombia                        | 0.848                           | <b>0.887</b>  | <b>0.811</b> | <b>0.169</b> | <b>0.145</b> |
| Denmark                         | 0.778                           | 0.937         | <b>0.895</b> | <b>0.101</b> | 0.083        |
| Finland                         | 0.776                           | <b>0.885</b>  | <b>0.809</b> | <b>0.113</b> | 0.094        |
| Flemish Community (Belgium)     | 0.788                           | 0.932         | <b>0.886</b> | 0.099        | 0.066        |
| Germany                         | 0.763                           | 0.902         | <b>0.836</b> | <b>0.136</b> | 0.080        |
| Ireland                         | 0.845                           | <b>0.892</b>  | <b>0.820</b> | <b>0.206</b> | <b>0.166</b> |
| Israel                          | 0.844                           | 0.989         | 0.966        | <b>0.158</b> | 0.034        |
| Japan                           | 0.831                           | 0.952         | 0.919        | 0.088        | 0.070        |
| Morocco                         | 0.880                           | 0.940         | 0.901        | <b>0.169</b> | 0.092        |
| Norway                          | 0.850                           | 0.982         | 0.947        | <b>0.155</b> | 0.032        |
| New Zealand                     | 0.835                           | 1.000         | 1.006        | 0.000        | 0.023        |
| Spain                           | 0.880                           | 0.958         | 0.929        | 0.097        | 0.060        |
| Sweden                          | 0.812                           | 0.950         | 0.916        | <b>0.108</b> | 0.081        |
| Türkiye                         | 0.915                           | 0.983         | 0.972        | 0.099        | 0.041        |
| International pooled data       | 0.844                           | 0.939         | <b>0.899</b> | <b>0.110</b> | 0.078        |
| <b>U3</b>                       |                                 |               |              |              |              |
| Canada                          | 0.883                           | 0.977         | 0.962        | 0.081        | 0.067        |
| Flemish Community (Belgium)     | 0.776                           | 0.987         | 0.979        | 0.032        | 0.072        |
| Germany                         | 0.829                           | 0.955         | 0.926        | <b>0.107</b> | 0.061        |
| Ireland                         | 0.883                           | 0.974         | 0.957        | 0.097        | 0.061        |
| Israel                          | 0.876                           | 0.990         | 0.970        | <b>0.135</b> | 0.034        |
| Norway                          | 0.902                           | 0.977         | 0.930        | <b>0.195</b> | 0.063        |
| New Zealand                     | 0.729                           | 1.000         | 0.999        | 0.047        | 0.036        |
| International pooled data       | 0.849                           | 0.956         | 0.927        | 0.088        | 0.057        |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.378. Measurement invariance results from MGCFA for scale S2LDLEAD with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.950     | 0.916 | 0.129 | 0.086 | -                       | -      | -       | -      |
| Equal loadings                | 0.948     | 0.942 | 0.107 | 0.101 | -0.002                  | 0.026  | -0.022  | 0.016  |
| Equal loadings and thresholds | 0.875     | 0.897 | 0.143 | 0.173 | -0.073                  | -0.046 | 0.036   | 0.072  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.971     | 0.952 | 0.086 | 0.071 | -                       | -      | -       | -      |
| Equal loadings                | 0.975     | 0.971 | 0.067 | 0.080 | 0.003                   | 0.019  | -0.019  | 0.009  |
| Equal loadings and thresholds | 0.830     | 0.850 | 0.152 | 0.203 | -0.145                  | -0.121 | 0.085   | 0.124  |

Note: New Zealand is excluded from measurement invariance testing in the ISCED level 02 population; New Zealand and Norway are excluded from measurement invariance testing in the U3 population.

Source: OECD, TALIS Starting Strong 2024 database.



**Table 11.379. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LDLEAD**

| Item    | Loading | Threshold 1 | Threshold 2 |
|---------|---------|-------------|-------------|
| SL2G41A | 0.740   | -1.179      | 0.100       |
| SL2G41B | 0.643   | 0.123       | 1.273       |
| SL2G41C | 0.652   | -0.323      | 0.884       |
| SL2G41D | 0.760   | -0.833      | 0.438       |
| SL2G41F | 0.752   | -1.123      | 0.200       |
| SL2G41G | 0.715   | -1.234      | 0.076       |

Source: OECD, TALIS Starting Strong 2024 database.

### Satisfaction with work at this ECEC setting (S2LJOBSAR)

The ECEC leader scale *Satisfaction with work at this ECEC setting* (S2LJOBSAR) was measured using three items (SL2G43D, SL2G43E and SL2G43F). These items assessed ECEC leaders' level of agreement with different statements related to their job. For each item, leaders could select one of the following response options: "Strongly disagree", "Disagree", "Agree" and "Strongly agree". Due to limited variability in responses, the categories "Strongly disagree" and "Disagree" were collapsed into a single category for scaling purposes. Higher scores indicate greater satisfaction with work at the ECEC setting. Table 11.380 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.381. The model fit indices for the S2LJOBSAR scale are not presented here as the scale was measured by just three items, resulting in a model that is just identified and therefore shows a perfect fit. The reliabilities for S2LJOBSAR are acceptable in all participating countries/territories.

Table 11.382 presents the results from the measurement invariance testing for S2LJOBSAR for the ISCED level 02 and U3 populations. As this is a three-item scale, the two baseline models have a perfect fit because the models are just identified. For ISCED level 02, the equal loadings model shows a good fit, with the CFI, TLI and SRMR within the cut-off criteria and the RMSEA very close to it. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off for the CFI, TLI and SRMR. However, the equal loadings and thresholds model shows acceptable CFI, TLI and close-to-acceptable SRMR. No special caution is required when comparing scale score results across countries/territories.

For the U3 population, the equal loadings model also shows a good fit, with the CFI, TLI, SRMR and RMSEA all within the cut-off criteria. The degree of change between the equal loadings and the equal thresholds and loadings model is within the cut-offs for all fit indices. No special caution is required when comparing scale score results across countries/territories.

Table 11.383 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LJOBSAR. All item loadings are high. Results by participating country/territory show a low loading for item SL2G43E in Germany (U3).

**Table 11.380. Items and response categories used in the construction of scale S2LJOBSAR**

| Scale or item | Question or item wording                                                                            |
|---------------|-----------------------------------------------------------------------------------------------------|
| S2LJOBSAR     | How strongly do you agree or disagree with the following statements?                                |
|               | Recoded response categories for scaling: 1=Strongly disagree or disagree; 2=Agree; 3=Strongly agree |
|               | Scale mid-point: 2                                                                                  |
| SL2G43D       | I enjoy working at this <ECEC setting>.                                                             |
| SL2G43E       | I am satisfied with the support that I receive from parents or guardians in this <ECEC setting>.    |

| Scale or item | Question or item wording                                                              |
|---------------|---------------------------------------------------------------------------------------|
| SL2G43F       | I am satisfied with the support that I receive from the staff in this <EEEC setting>. |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.381. Reliability coefficient alpha for single countries/territories and pooled model for scale S2LJOBSAR**

| Participating country/territory | Reliability<br>Cronbach's alpha |
|---------------------------------|---------------------------------|
| <b>ISCED level 02</b>           |                                 |
| Chile                           | 0.825                           |
| Colombia                        | 0.801                           |
| Denmark                         | 0.700                           |
| Finland                         | 0.827                           |
| Flemish Community (Belgium)     | 0.770                           |
| Germany                         | 0.747                           |
| Ireland                         | 0.836                           |
| Israel                          | 0.789                           |
| Japan                           | 0.781                           |
| Morocco                         | 0.780                           |
| Norway                          | 0.646                           |
| New Zealand                     | 0.743                           |
| Spain                           | 0.725                           |
| Sweden                          | 0.767                           |
| Türkiye                         | 0.811                           |
| International pooled data       | 0.789                           |
| <b>U3</b>                       |                                 |
| Canada                          | 0.816                           |
| Flemish Community (Belgium)     | 0.831                           |
| Germany                         | 0.643                           |
| Ireland                         | 0.634                           |
| Israel                          | 0.832                           |
| Norway                          | 0.796                           |
| New Zealand                     | 0.890                           |
| International pooled data       | 0.783                           |

Note: New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.382. Measurement invariance results from MGCFA for scale S2LJOBSAR with differences in model fits across models**

| Invariance model      | Model fit |       |       |       | Difference in model fit |        |         |        |
|-----------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                       | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b> |           |       |       |       |                         |        |         |        |
| Baseline              | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings        | 0.979     | 0.965 | 0.106 | 0.039 | -0.021                  | -0.035 | 0.106   | 0.039  |

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| Equal loadings and thresholds | 0.938     | 0.949 | 0.127 | 0.114 | -0.040                  | -0.016 | 0.021   | 0.075  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 1.000     | 1.000 | 0.000 | 0.000 | -                       | -      | -       | -      |
| Equal loadings                | 0.986     | 0.974 | 0.084 | 0.037 | -0.014                  | -0.026 | 0.084   | 0.037  |
| Equal loadings and thresholds | 0.996     | 0.996 | 0.034 | 0.069 | 0.009                   | 0.021  | -0.050  | 0.032  |

Note: New Zealand and Spain are excluded from measurement invariance testing in the ISCED level 02 population; New Zealand and Norway are excluded from measurement invariance testing in the U3 population.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.383. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LJOBSAR**

| Item    | Loading | Threshold 1 | Threshold 2 |
|---------|---------|-------------|-------------|
| SL2G43D | 0.785   | -1.569      | -0.155      |
| SL2G43E | 0.695   | -1.008      | 0.736       |
| SL2G43F | 0.770   | -1.415      | 0.272       |

Source: OECD, TALIS Starting Strong 2024 database.

### **Level of stress and impact on leaders' well-being (S2LSTRESL)**

The scale *Level of stress and its impact on leaders' well-being* (S2STRESL) was measured using four items (SL2G44A, SL2G44B, SL2G44C and SL2G44D). These items assessed the extent to which different situations related to well-being and stress occur. Response options included: "Not at all", "To some extent", "Quite a bit" and "A lot". Higher scores reflect greater perceived stress (and less perceived well-being). Item SL2G44B was reverse coded to ensure it had the same direction as the rest of the items, as this item was the only positively worded statement about well-being. Table 11.384 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.385. The reliabilities for S2STRESL are acceptable across all participating countries/territories, except for both the ISCED level 02 and U3 populations in Norway. As shown in Table 11.385, the CFI and TLI values for S2STRESL are generally acceptable. For the CFI, the only exception is the U3 population in Norway, while for the TLI the exceptions are both the ISCED level 02 and U3 populations in Norway, as well as the U3 population in New Zealand. The RMSEA exceeds the cut-off in several populations, particularly in the ISCED level 02 population in Denmark, Ireland, Israel and Sweden, where it is above 0.150. In the U3 population, the RMSEA exceeds the cut-off in Canada, New Zealand and Norway. SRMR values are mostly within the cut-off criterion, except for both ISCED level 02 and U3 populations in New Zealand, and in the U3 population in Norway. Based on the single CFA model fit results, the scale S2STRESL works well across all populations except in Norway (U3), where none of the model fit indices meet the acceptable cut-off criteria, and New Zealand (U3), where the TLI, RMSEA and SRMR do not meet the acceptable cut-off criteria.

Table 11.386 presents the results from the measurement invariance testing for S2STRESL for the ISCED level 02 and U3 populations. The baseline model shows an acceptable model fit based on the CFI, TLI, SRMR but exceeds the cut-off for the RMSEA in both populations. For ISCED level 02, the degree of change between the baseline and equal loadings models is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-offs for all fit indices. However, the equal loadings and thresholds model shows an acceptable CFI and a good TLI. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

For the U3 population, the degree of change between the baseline and equal loadings models is also within the cut-off criteria for all fit indices. The change between the equal loadings and the equal loadings and thresholds models exceeds all cut-offs, although it is close to the cut-off for the TLI. The equal loadings and thresholds model shows good CFI and TLI. Comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

Table 11.387 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LSTRESL. All item loadings are high, except for item SL2G44B which has a low loading. Results by participating country/territory also show a low loading for item SL2G44B in six ISCED level 02 countries/territories (Colombia, Denmark, Ireland, Israel, Japan and Türkiye) and four U3 countries/territories (Canada, Germany, Ireland, Israel).

**Table 11.384. Items and response categories used in the construction of scale S2LSTRESL**

| Scale or item | Question or item wording                                                                                                                                                                                                                        |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2LSTRESL     | In your experience as an <EEEC setting leader> at this <EEEC setting>, to what extent do the following occur?<br><i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i><br>Scale mid-point: 2.5 |
| SL2G44A       | I experience stress in my work.                                                                                                                                                                                                                 |
| SL2G44B*      | My job leaves me time for my personal life.                                                                                                                                                                                                     |
| SL2G44C       | My job negatively impacts my mental health.                                                                                                                                                                                                     |
| SL2G44D       | My job negatively impacts my physical health.                                                                                                                                                                                                   |

Source: OECD, TALIS Starting Strong 2024 database.

Note: \* Item was reverse coded.

**Table 11.385. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LSTRESL**

| Participating country/territory | Reliability      | CFA model fit |              |              |              |
|---------------------------------|------------------|---------------|--------------|--------------|--------------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR         |
| ISCED level 02                  |                  |               |              |              |              |
| Chile                           | 0.877            | 0.998         | 0.993        | <b>0.123</b> | 0.023        |
| Colombia                        | 0.772            | 0.989         | 0.968        | 0.093        | 0.025        |
| Denmark                         | 0.781            | 0.965         | <b>0.896</b> | <b>0.194</b> | 0.040        |
| Finland                         | 0.822            | 0.997         | 0.992        | 0.053        | 0.024        |
| Flemish Community (Belgium)     | 0.863            | 0.989         | 0.968        | <b>0.137</b> | 0.027        |
| Germany                         | 0.882            | 0.996         | 0.987        | <b>0.139</b> | 0.032        |
| Ireland                         | 0.817            | 0.984         | 0.951        | <b>0.272</b> | 0.047        |
| Israel                          | 0.771            | 0.933         | 0.921        | <b>0.150</b> | 0.066        |
| Japan                           | 0.807            | 0.995         | 0.986        | 0.078        | 0.029        |
| Morocco                         | 0.820            | 0.999         | 0.998        | 0.032        | 0.010        |
| Norway                          | <b>0.523</b>     | 0.915         | <b>0.899</b> | <b>0.103</b> | 0.086        |
| New Zealand                     | 0.810            | 0.945         | 0.936        | <b>0.110</b> | <b>0.114</b> |
| Spain                           | 0.831            | 0.989         | 0.966        | <b>0.115</b> | 0.031        |
| Sweden                          | 0.869            | 0.978         | 0.933        | <b>0.225</b> | 0.039        |
| Türkiye                         | 0.814            | 0.999         | 0.997        | 0.048        | 0.015        |
| International pooled data       | 0.801            | 0.994         | 0.982        | 0.092        | 0.019        |

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| U3                              |                  |               |       |       |       |
| Canada                          | 0.771            | 0.969         | 0.907 | 0.199 | 0.071 |
| Flemish Community (Belgium)     | 0.850            | 1.000         | 0.999 | 0.022 | 0.017 |
| Germany                         | 0.802            | 0.998         | 0.993 | 0.079 | 0.027 |
| Ireland                         | 0.775            | 1.000         | 1.004 | 0.000 | 0.011 |
| Israel                          | 0.808            | 0.963         | 0.956 | 0.086 | 0.063 |
| Norway                          | 0.546            | 0.793         | 0.756 | 0.118 | 0.118 |
| New Zealand                     | 0.781            | 0.902         | 0.884 | 0.139 | 0.149 |
| International pooled data       | 0.757            | 1.000         | 0.999 | 0.028 | 0.011 |

Note: Coefficients in **bold** exceed the cut-off criteria. New Zealand is excluded from the pooled ISCED level 02 and pooled U3 models.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.386. Measurement invariance results from MGCFA for scale S2LSTRESL with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.992     | 0.977 | 0.121 | 0.028 | -                       | -      | -       | -      |
| Equal loadings                | 0.991     | 0.988 | 0.086 | 0.051 | -0.002                  | 0.011  | -0.035  | 0.023  |
| Equal loadings and thresholds | 0.937     | 0.966 | 0.148 | 0.184 | -0.054                  | -0.022 | 0.062   | 0.133  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.991     | 0.974 | 0.128 | 0.033 | -                       | -      | -       | -      |
| Equal loadings                | 0.991     | 0.987 | 0.090 | 0.053 | -0.001                  | 0.013  | -0.038  | 0.020  |
| Equal loadings and thresholds | 0.957     | 0.974 | 0.129 | 0.195 | -0.034                  | -0.013 | 0.039   | 0.141  |

Note: Germany and New Zealand are excluded from measurement invariance testing in the ISCED level 02 population; New Zealand and Norway are excluded from measurement invariance testing in the U3 population.  
Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.387. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LSTRESL**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SL2G44A | 0.739   | -1.309      | 0.008       | 0.858       |
| SL2G44B | 0.352   | -1.377      | -0.224      | 1.250       |
| SL2G44C | 0.952   | -0.407      | 0.823       | 1.532       |
| SL2G44D | 0.841   | -0.311      | 0.907       | 1.562       |

Source: OECD, TALIS Starting Strong 2024 database.

### Sources of work stress associated with pedagogical leadership (S2LSTRESP)

The scale *Sources of work stress associated with pedagogical leadership* (S2LSTRESP) was measured using a set of five items (SL2G45B, SL2G45C, SL2G45D, SL2G45E and SL2G45F). These items assessed the extent to which various factors were sources of stress in teachers' work. For each item, teachers selected one of the following response options: "Not at all", "To some extent", "Quite a bit" and "A lot". Higher scores indicate greater perceived stress related to pedagogical leadership.

Table 11.388 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.389, except for Israel (ISCED level 02 and U3) where not all items in the scale were administered. Therefore, no scale results or scores are provided for Israel. The reliabilities for S2LSTRESP are above 0.700 across most populations. The only exception is the ISCED level 02 population in New Zealand, where the reliability coefficient does not meet the cut-off criterion by a small margin. In terms of model fit, the CFI, TLI and SRMR values for S2LSTRESP are acceptable across all ISCED level 02 participating countries/territories, except for the TLI in Germany. The CFI and TLI values fall below the cut-off for the following U3 populations: Ireland, New Zealand and Norway. The SRMR also exceeds the cut-off for the U3 population in New Zealand. RMSEA values exceed the cut-off in several populations but are generally close to the cut-off criterion. The only exceptions are the ISCED level 02 population in Colombia and Israel, as well as the U3 population in Ireland and New Zealand. In all of these cases RMSEA values are above 0.120. Based on the single CFA model fit results, the scale S2LSTRESP works well across all populations except in Ireland (U3) and Norway (U3), where the CFI, TLI and RMSEA do not meet the acceptable cut-off criteria, as well as in New Zealand (U3), where none of the model fit indices meet the acceptable cut-off criteria.

Table 11.390 presents the results from the measurement invariance testing for S2LSTRESP for the ISCED level 02 and U3 populations. For the ISCED level 02 population, the baseline model shows an acceptable fit based on all indices. The degree of change between the baseline and equal loadings models is within the cut-off criteria for the TLI, RMSEA, SRMR and very close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all fit indices. The overall model fit of the equal loadings and thresholds model shows an acceptable TLI. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

For the U3 population, the baseline model also shows an acceptable fit based on all indices. The degree of change between the baseline and equal loadings models is within the cut-off criteria for the TLI, RMSEA and SRMR, but exceeds the cut-off for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for the CFI, TLI and SRMR, and is close to the cut-off for the RMSEA. The overall model fit of the equal loadings and thresholds model shows an acceptable TLI and a close-to-acceptable RMSEA. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Table 11.391 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LSTRESP. All item loadings are high. Results by participating country/territory show a low loading for item SL2G45C in Canada (U3), Germany and Spain (both ISCED level 02), and as well as for item SL2G45F in Germany (ISCED level 02 and U3).

**Table 11.388. Items and response categories used in the construction of scale S2LSTRESP**

| Scale or item | Question or item wording                                                                                                                                                                                                                           |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S2LSTRESP     | Thinking about your job at this <ECEC setting>, to what extent are the following sources of stress in your work?<br><i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i><br>Scale mid-point: 2.5 |
| SL2G45B       | Being held responsible for children's development, well-being and learning                                                                                                                                                                         |
| SL2G45C       | Keeping up with changing requirements from <local, municipality/regional, state, or national/federal> authorities                                                                                                                                  |
| SL2G45D       | Managing <ECEC staff>                                                                                                                                                                                                                              |
| SL2G45E       | Addressing parent or guardian concerns                                                                                                                                                                                                             |
| SL2G45F       | Accommodating children with special education needs                                                                                                                                                                                                |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.389. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LSTRESP**

| Participating country/territory | Reliability      | CFA model fit |              |              |              |
|---------------------------------|------------------|---------------|--------------|--------------|--------------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR         |
| ISCED level 02                  |                  |               |              |              |              |
| Chile                           | 0.832            | 0.975         | 0.950        | <b>0.107</b> | 0.041        |
| Colombia                        | 0.868            | 0.974         | 0.949        | <b>0.121</b> | 0.041        |
| Denmark                         | 0.825            | 0.979         | 0.958        | <b>0.106</b> | 0.058        |
| Finland                         | 0.798            | 0.989         | 0.977        | 0.045        | 0.032        |
| Flemish Community (Belgium)     | 0.777            | 0.965         | 0.929        | <b>0.106</b> | 0.040        |
| Germany                         | 0.660            | 0.918         | <b>0.837</b> | <b>0.112</b> | 0.065        |
| Ireland                         | 0.830            | 1.000         | 1.003        | 0.000        | 0.032        |
| Israel                          | -                | -             | -            | -            | -            |
| Japan                           | 0.821            | 0.995         | 0.990        | 0.045        | 0.027        |
| Morocco                         | 0.871            | 0.990         | 0.981        | 0.084        | 0.022        |
| Norway                          | 0.755            | 0.934         | 0.918        | <b>0.106</b> | 0.075        |
| New Zealand                     | <b>0.598</b>     | 0.979         | 0.974        | 0.068        | 0.082        |
| Spain                           | 0.763            | 0.991         | 0.982        | 0.038        | 0.027        |
| Sweden                          | 0.816            | 0.979         | 0.958        | 0.083        | 0.030        |
| Türkiye                         | 0.842            | 1.000         | 1.005        | 0.000        | 0.013        |
| International pooled data       | 0.816            | 0.993         | 0.987        | 0.045        | 0.016        |
| U3                              |                  |               |              |              |              |
| Canada                          | 0.782            | 1.000         | 1.023        | 0.000        | 0.021        |
| Flemish Community (Belgium)     | 0.815            | 0.971         | 0.943        | 0.098        | 0.060        |
| Germany                         | 0.766            | 0.996         | 0.992        | 0.035        | 0.029        |
| Ireland                         | 0.817            | <b>0.891</b>  | <b>0.782</b> | <b>0.188</b> | 0.074        |
| Israel                          | -                | -             | -            | -            | -            |
| Norway                          | 0.772            | <b>0.870</b>  | <b>0.838</b> | <b>0.117</b> | 0.098        |
| New Zealand                     | 0.771            | <b>0.892</b>  | <b>0.865</b> | <b>0.170</b> | <b>0.156</b> |
| International pooled data       | 0.784            | 0.970         | 0.940        | 0.087        | 0.037        |

Note: Coefficients in **bold** exceed the cut-off criteria. Israel and New Zealand are excluded from the pooled ISCED level 02 and pooled U3 models. Israel (ISCED level 02, U3) was excluded from this scale because not all items that comprise the scale were administered.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.390. Measurement invariance results from MGCFA for scale S2LSTRESP with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.987     | 0.974 | 0.073 | 0.036 | -                       | -      | -       | -      |
| Equal loadings                | 0.981     | 0.978 | 0.068 | 0.052 | -0.006                  | 0.004  | -0.005  | 0.016  |
| Equal loadings and thresholds | 0.858     | 0.916 | 0.132 | 0.164 | -0.123                  | -0.062 | 0.065   | 0.112  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.964     | 0.927 | 0.104 | 0.046 | -                       | -      | -       | -      |



| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| Equal loadings                | 0.942     | 0.928 | 0.104 | 0.069 | -0.022                  | 0.000  | -0.000  | 0.023  |
| Equal loadings and thresholds | 0.860     | 0.905 | 0.119 | 0.173 | -0.082                  | -0.022 | 0.015   | 0.104  |

Note: Israel and New Zealand are excluded from measurement invariance testing in the ISCED level 02 population; New Zealand is excluded from measurement invariance testing in the U3 population.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.391. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LSTRESP**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SL2G45B | 0.720   | -0.716      | 0.324       | 1.146       |
| SL2G45C | 0.612   | -1.126      | -0.059      | 0.825       |
| SL2G45D | 0.756   | -0.832      | 0.207       | 1.087       |
| SL2G45E | 0.771   | -0.966      | 0.270       | 1.197       |
| SL2G45F | 0.612   | -0.739      | 0.285       | 1.099       |

Source: OECD, TALIS Starting Strong 2024 database.

### Sources of work stress associated with general leadership concerns (S2LSTRESG)

The scale *Sources of work stress associated with general leadership concerns* (S2LSTRESG) was measured using a set of five items. These items (SL2G45A, SL2G45G, SL2G45H, SL2G45I and SL2G45J) assessed the extent to which various factors were sources of stress in ECEC leaders' work. Response options included: "Not at all", "To some extent", "Quite a bit" and "A lot". Higher scores in this scale indicate greater perceived stress in terms of general leadership concerns. Table 11.392 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all populations, as well as for the pooled models for ISCED level 02 and U3, are presented in Table 11.393, except for Israel (ISCED level 02 and U3) where not all items in the scale were administered. Therefore, no scale results or scores are provided for Israel. The reliabilities for S2LSTRESG are generally acceptable, except for the ISCED level 02 population in Japan and Norway, and both the ISCED level 02 and U3 populations in New Zealand. In terms of model fit, the CFI and SRMR are acceptable in almost all participating countries/territories, the only exception is the ISCED level 02 population in New Zealand. The TLI is also acceptable in most populations, except for the ISCED level 02 population in Japan, Morocco, New Zealand and Spain, as well as in the U3 population in Canada. RMSEA values exceed the cut-off only in the following ISCED level 02 population: Israel, Morocco, New Zealand and Türkiye. Based on the single CFA model fit results, the scale S2LSTRESG works well across all populations except in New Zealand (ISCED level 02), where the CFI, TLI, RMSEA and SRMR do not meet the acceptable cut-off criteria.

Table 11.394 presents the results from the measurement invariance testing for S2LSTRESG for the ISCED level 02 and U3 populations. The results are similar for both populations, with an acceptable fit for the baseline model based on all indices. The degree of change between the baseline and equal loadings model is within the cut-off criteria for the TLI, RMSEA and SRMR, and close for the CFI. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-offs for all fit indices. Furthermore, the equal loadings and thresholds models of both populations show a poor model fit. Comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution for both the ISCED level 02 and the U3 populations.



Table 11.395 presents the standardised item loadings and thresholds based on pooled data from the ISCED level 02 population for the scale S2LSTRESG. Item SL2G45H shows a high loading, while the loadings for the remaining items are within the acceptable range. Results by participating country/territory show a low loading for item SL2G45A in four ISCED level 02 countries/territories (Japan, Morocco, Spain and Sweden) and in the U3 population in the Flemish Community of Belgium; for item SL2G45G in the ISCED level 02 population in the Flemish Community of Belgium and Germany; for item SL2G45H in Germany (ISCED level 02); for item SL2G45I in Canada (U3), Germany (ISCED level 02 and U3), Japan and Sweden (both ISCED level 02); and for item SL2G45J in four ISCED level 02 populations (Colombia, Japan, Spain and Sweden) as well as in the U3 population in the Flemish Community of Belgium and Germany.

**Table 11.392. Items and response categories used in the construction of scale S2LSTRESG**

| Scale or item | Question or item wording                                                                                                                     |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| S2LSTRESG     | Thinking about your job at this <ECEC setting>, to what extent are the following sources of stress in your work?                             |
|               | <i>Recoded response categories for scaling: 1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot</i>                                       |
|               | Scale mid-point: 2.5                                                                                                                         |
| SL2G45A       | Having too much administrative work to do (e.g. filling out forms)                                                                           |
| SL2G45G       | Lacking human resources (e.g. insufficient roles, unfilled positions, absent staff)                                                          |
| SL2G45H       | Lacking other resources (e.g. financial support and material resources)                                                                      |
| SL2G45I       | Lacking technical skills for the use of <digital resources and tools>                                                                        |
| SL2G45J       | Having to adapt my practice due to unexpected disruptions (e.g. natural disasters, public health emergencies/pandemics, humanitarian crises) |

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.393. Reliability coefficient alpha and CFA model fits for single countries/territories and pooled model for scale S2LSTRESG**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| ISCED level 02                  |                  |               |       |       |       |
| Chile                           | 0.765            | 0.964         | 0.929 | 0.088 | 0.044 |
| Colombia                        | 0.696            | 0.960         | 0.920 | 0.065 | 0.057 |
| Denmark                         | 0.740            | 0.995         | 0.991 | 0.024 | 0.055 |
| Finland                         | 0.756            | 0.971         | 0.941 | 0.078 | 0.052 |
| Flemish Community (Belgium)     | 0.688            | 1.000         | 1.041 | 0.000 | 0.025 |
| Germany                         | 0.617            | 1.000         | 1.102 | 0.000 | 0.040 |
| Ireland                         | 0.819            | 0.997         | 0.993 | 0.023 | 0.047 |
| Israel                          | -                | -             | -     | -     | -     |
| Japan                           | 0.599            | 0.937         | 0.875 | 0.064 | 0.041 |
| Morocco                         | 0.728            | 0.919         | 0.838 | 0.123 | 0.050 |
| Norway                          | 0.443            | 0.979         | 0.958 | 0.077 | 0.050 |
| New Zealand                     | 0.237            | 0.840         | 0.679 | 0.159 | 0.112 |
| Spain                           | 0.719            | 0.939         | 0.879 | 0.080 | 0.049 |
| Sweden                          | 0.641            | 0.991         | 0.982 | 0.030 | 0.042 |
| Türkiye                         | 0.823            | 0.956         | 0.912 | 0.160 | 0.049 |
| International pooled data       | 0.703            | 0.951         | 0.902 | 0.070 | 0.035 |
| U3                              |                  |               |       |       |       |
| Canada                          | 0.604            | 0.900         | 0.800 | 0.066 | 0.059 |
| Flemish Community (Belgium)     | 0.709            | 0.964         | 0.927 | 0.090 | 0.062 |
| Germany                         | 0.637            | 1.000         | 1.008 | 0.000 | 0.043 |

| Participating country/territory | Reliability<br>Cronbach's alpha | CFA model fit |       |       |       |
|---------------------------------|---------------------------------|---------------|-------|-------|-------|
|                                 |                                 | CFI           | TLI   | RMSEA | SRMR  |
| Ireland                         | 0.739                           | 1.000         | 1.057 | 0.000 | 0.037 |
| Israel                          | -                               | -             | -     | -     | -     |
| Norway                          | 0.656                           | 1.000         | 1.058 | 0.000 | 0.022 |
| New Zealand                     | <b>0.442</b>                    | 0.998         | 0.996 | 0.044 | 0.088 |
| International pooled data       | 0.707                           | 0.979         | 0.959 | 0.044 | 0.032 |

Note: Coefficients in **bold** exceed the cut-off criteria. Israel and New Zealand are excluded from the pooled ISCED level 02 and pooled U3 models. Israel (ISCED level 02, U3) was excluded from this scale because not all items that comprise the scale were administered.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.394. Measurement invariance results from MGCFA for scale S2LSTRESG with differences in model fits across models**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>ISCED level 02</b>         |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.963     | 0.925 | 0.086 | 0.045 | -                       | -      | -       | -      |
| Equal loadings                | 0.949     | 0.941 | 0.077 | 0.070 | -0.013                  | 0.016  | -0.010  | 0.024  |
| Equal loadings and thresholds | 0.627     | 0.776 | 0.149 | 0.243 | -0.322                  | -0.164 | 0.072   | 0.173  |
| <b>U3</b>                     |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.983     | 0.966 | 0.042 | 0.050 | -                       | -      | -       | -      |
| Equal loadings                | 0.974     | 0.967 | 0.041 | 0.070 | -0.009                  | 0.001  | -0.001  | 0.019  |
| Equal loadings and thresholds | 0.829     | 0.884 | 0.078 | 0.145 | -0.144                  | -0.083 | 0.036   | 0.076  |

Note: Denmark, Israel, New Zealand and Sweden are excluded from measurement invariance testing in the ISCED level 02 population; New Zealand is excluded from measurement invariance testing in the U3 population.

Source: OECD, TALIS Starting Strong 2024 database.

**Table 11.395. Item loadings and thresholds based on pooled ISCED level 02 data for scale S2LSTRESG**

| Item    | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|---------|---------|-------------|-------------|-------------|
| SL2G45A | 0.498   | -1.322      | -0.298      | 0.631       |
| SL2G45G | 0.583   | -1.032      | -0.189      | 0.541       |
| SL2G45H | 0.687   | -0.956      | 0.088       | 0.821       |
| SL2G45I | 0.576   | -0.284      | 0.829       | 1.527       |
| SL2G45J | 0.525   | -0.395      | 0.657       | 1.324       |

Source: OECD, TALIS Starting Strong 2024 database.

### 11.4.3. TALIS Teacher Knowledge Survey (TKS)

#### *Complex scales from the teacher questionnaire*

Most of the TKS scales were included in the core survey. For these scales, only country/territory-specific results are presented as the item parameters used for scale construction were already presented in the descriptions of the respective scales for the core survey. The TKS questionnaires also included a set of questions – not administered in the core survey questionnaire – to elicit teachers' opportunities to learn about different topics related to pedagogy during their studies (whether during formal teacher education or through following professional learning courses or activities). The answers to these questions were used

to create four scales, which provide a summary measure of such opportunities. These scales are presented with a full description at the end of this section.

### Exchange of information and ideas among teachers (T4EXINF)

The degree of *Exchange of information and ideas among teachers* (T4EXINF) was measured by three items (TT4G26D, TT4G26E, TT4G26F), presented in Table 11.28. In this question, teachers were asked to indicate at which frequency they exchange teaching materials with colleagues, engage in discussions about the learning development of specific students, and work with other teachers in the school to ensure common standards in evaluations for assessing student progress. Higher values on this scale indicate more frequent exchange of information and ideas.

Table 11.396 presents scale reliabilities for all TKS participating countries/territories as well as for the pooled model including data from all participating education systems. The fit indices for the T4EXINF scale are not presented here as the scale was measured by just three items and the fit indices indicate a perfect model fit. The reliabilities for T4EXINF are generally high (above 0.700) across countries/territories.

Measurement invariance testing for this scale was based on the ISCED level 2 population of the core survey, presented in Table 11.30. Standardised item loadings and thresholds based on the pooled ISCED level 2 core survey data for scale T4EXINF are presented in Table 11.31. Item loadings from single TKS countries/territories are high.

**Table 11.396. Reliability coefficient alpha for single countries and pooled model for scale T4EXINF**

| Participating country/territory | Reliability coefficient<br>Cronbach's alpha |
|---------------------------------|---------------------------------------------|
| <b>TKS</b>                      |                                             |
| Chile                           | 0.782                                       |
| Croatia                         | 0.743                                       |
| Morocco                         | 0.777                                       |
| Poland                          | 0.760                                       |
| Portugal                        | 0.800                                       |
| Saudi Arabia                    | 0.828                                       |
| South Africa                    | 0.773                                       |
| United States                   | 0.813                                       |
| International pooled data       | 0.804                                       |

Source: OECD, TALIS 2024 database.

### Professional collaboration in lessons among teachers (T4COLES)

The degree of *Professional collaboration in lessons among teachers* (T4COLES) was measured by four items (TT4G26A, TT4G26B, TT4G26C, TT4G26G). Teachers were asked to indicate the frequency with which they teach jointly as a team in the same class, observe other teachers' classes and provide feedback, engage in joint activities across different classes and age groups, and take part in collaborative professional learning. Higher values on this scale indicate more frequent professional collaboration among teachers. Table 11.32 provides the item names, question stem, item statements and response options for the items belonging to this scale as well as the scale mid-point.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.397. The reliabilities for T4COLES are generally acceptable (above 0.650), except for Poland. In terms of model fit, the CFI and SRMR are within the cut-off criteria in all countries/territories. The TLI does not meet the cut-off criteria in Portugal and Saudi Arabia, while the RMSEA does not meet the cut-off in Saudi Arabia.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.34. Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4COLES are presented in Table 11.35. Results by participating TKS country/territory show an item loading below the threshold for item TT4G26G in Croatia and in the United States.

**Table 11.397. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4COLES**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| <b>TKS</b>                      |                  |               |              |              |       |
| Chile                           | 0.708            | 1.000         | 1.004        | 0.000        | 0.006 |
| Croatia                         | 0.664            | 0.979         | 0.937        | 0.072        | 0.018 |
| Morocco                         | 0.805            | 0.985         | 0.955        | 0.058        | 0.019 |
| Poland                          | 0.638            | 0.967         | 0.902        | 0.075        | 0.019 |
| Portugal                        | 0.657            | 0.962         | <b>0.886</b> | 0.097        | 0.022 |
| Saudi Arabia                    | 0.814            | 0.949         | <b>0.846</b> | <b>0.234</b> | 0.034 |
| South Africa                    | 0.692            | 0.995         | 0.984        | 0.028        | 0.012 |
| United States                   | 0.781            | 0.997         | 0.990        | 0.042        | 0.009 |
| International sample            | 0.723            | 1.000         | 1.000        | 0.000        | 0.002 |

Note. Coefficients in **bold** exceed the cut-off criteria.

Source: OECD, TALIS 2024 database.

### **Self-efficacy in classroom management (T4SECLS)**

The scale of *Self-efficacy in classroom management* (T4SECLS) was measured by a set of four items (TT4G27D, TT4G27F, TT4G27H, TT4G27I). Teachers had to indicate to what extent they could control disruptive behaviour in the classroom, make expectations about student behaviour clear, get students to follow classroom rules, and calm a student who is disruptive or noisy. Items belonging to this scale, including variable names and response categories, are described in Table 11.36. Higher values on this scale indicate higher self-efficacy in classroom management.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.398. The scale T4SECLS has high reliability (above 0.800) in all populations. The scale also shows a good model fit, with all indices meeting the established cut-off criteria. The CFI, TLI and SRMR satisfy the good fit criteria across all participating countries/territories, while the RMSEA indicates good fit for most countries/territories and acceptable fit for the remaining ones.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.38. Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4SECLS are presented in Table 11.39.

**Table 11.398. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4SECLS**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| <b>TKS</b>                      |                  |               |       |       |       |
| Chile                           | 0.883            | 0.998         | 0.995 | 0.051 | 0.012 |
| Croatia                         | 0.919            | 0.998         | 0.995 | 0.073 | 0.011 |
| Morocco                         | 0.823            | 0.999         | 0.998 | 0.017 | 0.008 |
| Poland                          | 0.917            | 0.997         | 0.992 | 0.064 | 0.013 |
| Portugal                        | 0.911            | 1.000         | 0.999 | 0.040 | 0.007 |
| Saudi Arabia                    | 0.948            | 0.999         | 0.996 | 0.071 | 0.010 |
| South Africa                    | 0.893            | 0.999         | 0.996 | 0.042 | 0.015 |
| United States                   | 0.905            | 1.000         | 0.999 | 0.022 | 0.005 |
| International pooled data       | 0.900            | 0.999         | 0.998 | 0.037 | 0.007 |

Note. Coefficients in **bold** exceed the cut-off criteria.

Source: OECD, TALIS 2024 database.

### Self-efficacy in instruction (T4SEINS)

The scale of *Self-efficacy in instruction* (T4SEINS) was based on four items (TT4G27C, TT4G27J, TT4G27K, TT4G27L). In these items, teachers had to indicate to what extent they could craft good questions for students, use a variety of assessment strategies, provide an alternative explanation for students, and vary instructional strategies in their classroom (see Table 11.40). Higher values on this scale indicate higher self-efficacy.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.399. The reliabilities for T4SEINS are high, above 0.800 in all participating countries/territories. As can be seen in Table 11.399, the scale T4SEINS has a good model fit across all participating countries/territories, with the CFI, TLI, SRMR and RMSEA all within the cut-off criteria.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.42. Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4SEINS are presented in Table 11.43. Loadings for all items are high for the single TKS countries/territories.

**Table 11.399. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4SEINS**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| <b>TKS</b>                      |                  |               |       |       |       |
| Chile                           | 0.852            | 0.992         | 0.975 | 0.079 | 0.021 |
| Croatia                         | 0.875            | 0.998         | 0.993 | 0.054 | 0.011 |
| Morocco                         | 0.805            | 0.998         | 0.993 | 0.027 | 0.011 |
| Poland                          | 0.887            | 1.000         | 1.000 | 0.007 | 0.004 |
| Portugal                        | 0.871            | 1.000         | 1.001 | 0.000 | 0.002 |
| Saudi Arabia                    | 0.953            | 1.000         | 0.999 | 0.032 | 0.004 |
| South Africa                    | 0.845            | 0.992         | 0.977 | 0.066 | 0.020 |
| United States                   | 0.888            | 1.000         | 0.999 | 0.021 | 0.005 |
| International pooled data       | 0.883            | 0.998         | 0.995 | 0.038 | 0.008 |

Note. Coefficients in **bold** exceed the cut-off criteria.

Source: OECD, TALIS 2024 database.

### Self-efficacy in student engagement (T4SEENG)

The scale of *Self-efficacy in student engagement* (T4SEENG) was measured by four items (TT4G27A, TT4G27B, TT4G27E, TT4G27G), described in Table 11.44. Teachers had to indicate to what extent they could get students to believe they can do well in schoolwork, help students value learning, motivate students who show low interest in schoolwork, and help students think critically. Higher values on this scale indicate higher self-efficacy.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.400. The reliabilities for T4SEENG are high, generally above 0.850, in all participating countries/territories. The scale T4SEENG also shows a good model fit, with the CFI, TLI and SRMR within the good model fit cut-off criteria for all participating countries/territories and RMSEA values within the acceptable cut-off criteria.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.46. Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4SEENG are presented in Table 11.47. All items show high loadings for the single TKS countries/territories.

**Table 11.400. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4SEENG**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| <b>TKS</b>                      |                  |               |       |       |       |
| Chile                           | 0.852            | 0.992         | 0.976 | 0.088 | 0.021 |
| Croatia                         | 0.872            | 0.999         | 0.997 | 0.040 | 0.009 |
| Morocco                         | 0.848            | 0.996         | 0.987 | 0.053 | 0.015 |
| Poland                          | 0.878            | 0.992         | 0.977 | 0.090 | 0.019 |
| Portugal                        | 0.882            | 0.997         | 0.991 | 0.087 | 0.019 |
| Saudi Arabia                    | 0.939            | 0.997         | 0.990 | 0.098 | 0.014 |
| South Africa                    | 0.875            | 0.999         | 0.998 | 0.035 | 0.012 |
| United States                   | 0.906            | 0.997         | 0.991 | 0.067 | 0.010 |
| International pooled data       | 0.902            | 0.999         | 0.996 | 0.055 | 0.010 |

Note. Coefficients in **bold** exceed the cut-off criteria.

Source: OECD, TALIS 2024 database.

### Clarity of instruction (T4CLAIN)

The scale of *Clarity of instruction* (T4CLAIN) was measured by a set of four items (TT4G51A, TT4G51B, TT4G51C and TT4G51D). Teachers had to indicate the frequency with which they did the different activities described in Table 11.84, including presenting a summary of recently learned content, setting goals at the beginning of a lesson or a unit, explaining what they expect the students to learn, and explain how new and old topics are related. Higher values on this scale indicate a higher frequency of clarity of instruction activities.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.401. Reliability for T4CLAIN is high, above 0.750, in most participants, with none of them below the established cut-off criteria. In terms of CFA model fit, the CFI and SRMR for T4CLAIN are all within the acceptable cut-off criteria in all populations. The TLI is acceptable in most countries/territories, except for Chile and Portugal. The RMSEA is also acceptable in most countries/territories, except for Portugal.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.86. Standardised item loadings and thresholds based on the pooled ISCED level 2 data for the scale T4CLAIN are presented in Table 11.87. Results for single TKS countries/territories show a low loading for item TT4G27A in Croatia and Morocco.

**Table 11.401. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4CLAIN**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| <b>TKS</b>                      |                  |               |              |              |       |
| Chile                           | 0.773            | 0.954         | <b>0.863</b> | 0.098        | 0.038 |
| Croatia                         | 0.756            | 0.991         | 0.972        | 0.062        | 0.020 |
| Morocco                         | 0.719            | 0.979         | 0.936        | 0.066        | 0.024 |
| Poland                          | 0.805            | 0.986         | 0.958        | 0.075        | 0.027 |
| Portugal                        | 0.741            | 0.949         | <b>0.847</b> | <b>0.136</b> | 0.037 |
| Saudi Arabia                    | 0.906            | 0.995         | 0.984        | 0.083        | 0.013 |
| South Africa                    | 0.812            | 0.991         | 0.974        | 0.065        | 0.021 |
| United States                   | 0.812            | 0.983         | 0.950        | 0.091        | 0.027 |
| International pooled data       | 0.781            | 0.967         | 0.902        | <b>0.103</b> | 0.031 |

Note. Coefficients in **bold** exceed the cut-off criteria.

Source: OECD, TALIS 2024 database.

### Cognitive activation (T4COGAC)

The scale of *Cognitive activation* (T4COGAC) was measured by a set of four items (TT4G51E, TT4G51F, TT4G51G and TT4G51H). Teachers had to indicate the frequency with which they did the different activities presented in Table 11.88, including presenting tasks for which there is no obvious solution, giving tasks that require students to think critically, having students work in small groups to come up with a joint solution to a problem or task, and asking students to decide on their own procedures for solving complex tasks. Higher values on this scale indicate a higher frequency of cognitive activation practices.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.402. The reliabilities for T4COGAC are generally high, with values mostly above 0.700 in across populations, except for Croatia. As can be observed from Table 11.402, the CFI and SRMR are within the cut-off criteria for all participants. The TLI and RMSEA do not meet the cut-off criteria in most participating countries/territories, specifically in Chile, Croatia, Morocco, Poland, Portugal, as well as in the pooled TKS model. The RMSEA also exceeds the cut-off in Saudi Arabia.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.90. Based on the results of measurement invariance testing, comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4COGAC are presented in Table 11.91. Results from single TKS participating countries/territories show high loadings for all items.



**Table 11.402. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4COGAC**

| Participating country/territory | Reliability      | CFA model fit |              |              |       |
|---------------------------------|------------------|---------------|--------------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI          | RMSEA        | SRMR  |
| <b>TKS</b>                      |                  |               |              |              |       |
| Chile                           | 0.776            | 0.933         | <b>0.798</b> | <b>0.167</b> | 0.048 |
| Croatia                         | 0.654            | 0.946         | <b>0.839</b> | <b>0.111</b> | 0.030 |
| Morocco                         | 0.737            | 0.956         | <b>0.868</b> | <b>0.117</b> | 0.039 |
| Poland                          | 0.721            | 0.946         | <b>0.839</b> | <b>0.119</b> | 0.039 |
| Portugal                        | 0.765            | 0.921         | <b>0.764</b> | <b>0.233</b> | 0.053 |
| Saudi Arabia                    | 0.859            | 0.991         | 0.973        | <b>0.131</b> | 0.026 |
| South Africa                    | 0.746            | 0.978         | 0.933        | 0.087        | 0.026 |
| United States                   | 0.786            | 0.994         | 0.983        | 0.056        | 0.016 |
| International pooled data       | 0.763            | 0.966         | <b>0.897</b> | <b>0.121</b> | 0.033 |

Note. Coefficients in **bold** exceed the cut-off criteria.

Source: OECD, TALIS 2024 database.

### Classroom management (T4CLASM)

The scale of *Classroom management* (T4CLASM) was measured by a set of four items (TT4G51I, TT4G51J, TT4G51K and TT4G51L). Teachers had to indicate the frequency with which they did different classroom management practices as described in Table 11.92, including telling students to follow classroom rules, telling students to listen to what the teacher says, calming students who are disruptive, and telling students to quieten down quickly at the beginning of a lesson. Higher values on this scale indicate a higher frequency of classroom management practices.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.403. The reliabilities for T4CLASM are high in all populations, with values mostly above 0.900. As can be observed from Table 11.403, the CFI, TLI and SRMR for T4CLASM are all within the good cut-off criteria for all participants. The RMSEA of most participants is high, considerably exceeding the cut-off criteria in Croatia, Poland and Saudi Arabia.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.94. Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4CLASM are presented in Table 11.95. Results by participating TKS country/territory indicate a low loading for item TT4G51L in Portugal.

**Table 11.403. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4CLASM**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| <b>TKS</b>                      |                  |               |       |              |       |
| Chile                           | 0.911            | 0.992         | 0.975 | <b>0.102</b> | 0.022 |
| Croatia                         | 0.913            | 0.993         | 0.980 | <b>0.158</b> | 0.024 |
| Morocco                         | 0.860            | 0.987         | 0.960 | <b>0.101</b> | 0.028 |
| Poland                          | 0.922            | 0.992         | 0.975 | <b>0.152</b> | 0.025 |
| Portugal                        | 0.774            | 0.995         | 0.984 | 0.081        | 0.025 |
| Saudi Arabia                    | 0.926            | 0.991         | 0.973 | <b>0.129</b> | 0.021 |



| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| South Africa                    | 0.887            | 0.994         | 0.983 | <b>0.117</b> | 0.022 |
| United States                   | 0.878            | 0.985         | 0.955 | <b>0.117</b> | 0.025 |
| International pooled data       | 0.913            | 0.995         | 0.984 | 0.097        | 0.018 |

Note. Coefficients in **bold** exceed the cut-off criteria

Source: OECD, TALIS 2024 database.

### Adaptive learning (T4ADLE)

The scale of *Adaptive learning* (T4ADLE) was measured using five items (TT4G55A, TT4G55B, TT4G55C, TT4G55D, TT4G55E), in which teachers had to indicate how frequently they performed different actions related to adapting their teaching to the needs of their students. These actions include considering students' prior knowledge and needs when planning a lesson, pointing students to different materials for learning depending on their needs, changing their way of explaining when a student has difficulties understanding a topic or task, adapting their teaching methods to students' needs, and asking questions at various difficulty levels. Higher values on these scales indicate a higher frequency of such practices. Table 11.108 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.404. The scale T4ADLE has high reliability (above 0.800) in all countries/territories. The scale also shows a good model fit, with the CFI, TLI and SRMR all within the good cut-off criteria for all participants, and the RMSEA within the acceptable range.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.110. Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4ADLE are presented in Table 11.111. All items show high loadings for the single TKS countries/territories.

**Table 11.404. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4ADLE**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| <b>TKS</b>                      |                  |               |       |       |       |
| Chile                           | 0.877            | 0.987         | 0.973 | 0.075 | 0.025 |
| Croatia                         | 0.874            | 0.990         | 0.980 | 0.089 | 0.025 |
| Morocco                         | 0.814            | 0.988         | 0.976 | 0.044 | 0.023 |
| Poland                          | 0.875            | 0.997         | 0.994 | 0.035 | 0.017 |
| Portugal                        | 0.844            | 0.991         | 0.981 | 0.061 | 0.027 |
| Saudi Arabia                    | 0.913            | 0.992         | 0.985 | 0.082 | 0.019 |
| South Africa                    | 0.885            | 0.992         | 0.983 | 0.062 | 0.022 |
| United States                   | 0.865            | 0.990         | 0.981 | 0.065 | 0.025 |
| International pooled data       | 0.872            | 0.992         | 0.983 | 0.055 | 0.020 |

Source: OECD, TALIS 2024 database.

### Progression-based learning (T4PBLE)

The scale of *Progression-based learning* (T4PBLE) was measured by a set of four items (TT4G56A, TT4G56B, TT4G56C, TT4G56D), described in Table 11.112. Teachers had to indicate the frequency with which they let students review multiple examples to practice the steps involved in a procedure or skill, select tasks for student practice that gradually increase in difficulty, prepare students for difficulties that can occur while practicing a procedure or skill, and let students practise similar tasks until the teacher knows that every student has understood the subject matter. Higher scores on this scale reflect a higher frequency of progression-based learning practices.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.405. The reliabilities for T4PBLE are generally high and greater than 0.800 in all countries/territories. As can be seen in Table 11.405, the scale T4PBLE shows a good model fit in all participants, based on all model fit indices presented.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.114. Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4PBLE are presented in Table 11.115. All items show high loadings for the single TKS countries/territories.

**Table 11.405. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4PBLE**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| <b>TKS</b>                      |                  |               |       |              |       |
| Chile                           | 0.884            | 0.999         | 0.996 | 0.036        | 0.008 |
| Croatia                         | 0.830            | 0.997         | 0.991 | 0.054        | 0.011 |
| Morocco                         | 0.839            | 0.994         | 0.983 | 0.057        | 0.016 |
| Poland                          | 0.840            | 0.992         | 0.975 | 0.067        | 0.016 |
| Portugal                        | 0.839            | 1.000         | 0.999 | 0.021        | 0.006 |
| Saudi Arabia                    | 0.923            | 0.997         | 0.992 | 0.096        | 0.012 |
| South Africa                    | 0.877            | 0.992         | 0.976 | 0.088        | 0.018 |
| United States                   | 0.829            | 0.987         | 0.960 | <b>0.104</b> | 0.023 |
| International pooled data       | 0.858            | 0.994         | 0.983 | 0.065        | 0.014 |

Note. Coefficients in **bold** exceed the cut-off criteria.

Source: OECD, TALIS 2024 database.

### Fulfilment of lesson aims (complexity of teaching) (T4FULFIL)

The scale of *Fulfilment of lesson aims (complexity of teaching)* (T4FULFIL) was measured by a set of five items (TT4G58A, TT4G58B, TT4G58C, TT4G58D and TT4G58E). These items assessed the extent to which teachers believed they had achieved various instructional goals, reflecting the complexity of the teaching activity, in their recently taught lessons (Table 11.120). Specifically, these goals were: presenting the content in a comprehensible way, engaging students in work that challenges them, providing students with feedback to support their learning, offering students opportunities to practise what they learned, and adapting teaching to meet the different needs of students. Higher scores indicate a greater perceived fulfilment of lesson aims by teachers.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.406. The scale T4FULFIL has a high reliability (above 0.800) in all

countries/territories. The scale also shows a good model fit, with the CFI, TLI and SRMR all within the good cut-off criteria for all participants and the RMSEA within the acceptable cut-off.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.122. Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4FULFIL are presented in Table 11.123. All items show high loadings for the single TKS countries/territories.

**Table 11.406. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4FULFIL**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| <b>TKS</b>                      |                  |               |       |       |       |
| Chile                           | 0.832            | 0.989         | 0.978 | 0.051 | 0.023 |
| Croatia                         | 0.862            | 0.991         | 0.982 | 0.069 | 0.022 |
| Morocco                         | 0.830            | 0.988         | 0.976 | 0.050 | 0.022 |
| Poland                          | 0.863            | 0.995         | 0.989 | 0.040 | 0.018 |
| Portugal                        | 0.832            | 0.995         | 0.989 | 0.046 | 0.017 |
| Saudi Arabia                    | 0.934            | 0.998         | 0.996 | 0.052 | 0.010 |
| South Africa                    | 0.866            | 0.988         | 0.975 | 0.065 | 0.026 |
| United States                   | 0.860            | 0.984         | 0.968 | 0.080 | 0.029 |
| International pooled data       | 0.864            | 0.994         | 0.989 | 0.043 | 0.015 |

Note. Portugal excluded from the pooled TKS model.

Source: OECD, TALIS 2024 database.

### Workload stress (T4WLOADT)

The scale of *Workload stress* (T4WLOADT) was measured by a set of four items (TT4G77A, TT4G77B, TT4G77C and TT4G77D). Teachers had to indicate to what extent they experienced stress in their work due to having too much lesson preparation, having too many lessons to teach, having too much marking, having too much administrative work to do. Higher scores indicate greater perceived stress related to workload. Table 11.176 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.407. The scale T4WLOADT has high reliability (above 0.800) across all participants. The scale also exhibits a good model fit, with the CFI, TLI and SRMR within the good cut-off criteria and the RMSEA within the acceptable cut-off for all participants.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.178. Based on the measurement invariance testing results, comparisons of results across countries and territories on this scale are affected by moderate model fit issues in the most restricted multi-group model and should be interpreted with some caution.

Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4WLOADT are presented in Table 11.179. Results by TKS country/territory show high loadings for all items.

**Table 11.407. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4WLOADT**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| <b>TKS</b>                      |                  |               |       |       |       |
| Chile                           | 0.831            | 0.995         | 0.985 | 0.055 | 0.016 |
| Croatia                         | 0.835            | 0.995         | 0.986 | 0.069 | 0.014 |
| Morocco                         | 0.839            | 0.990         | 0.970 | 0.071 | 0.020 |
| Poland                          | 0.811            | 1.000         | 1.002 | 0.000 | 0.002 |
| Portugal                        | 0.839            | 0.998         | 0.995 | 0.069 | 0.015 |
| Saudi Arabia                    | 0.906            | 0.997         | 0.992 | 0.084 | 0.012 |
| South Africa                    | 0.831            | 0.993         | 0.979 | 0.080 | 0.022 |
| United States                   | 0.847            | 0.992         | 0.977 | 0.089 | 0.021 |
| International pooled data       | 0.843            | 0.994         | 0.982 | 0.076 | 0.018 |

Source: OECD, TALIS 2024 database.

### Student behaviour stress (T4STBEH)

The scale *Student behaviour stress* (T4STBEH) was measured using a set of three items (TT4G77F, TT4G77G and TT4G77H). These items assessed the extent to which factors such as being held responsible for students' achievement, maintaining classroom discipline, and being intimidated or verbally abused by students were sources of stress in teachers' work. Higher scores indicate greater perceived stress related to student behaviour. Table 11.180 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.408. The fit indices for the T4STBEH scale are not presented here as the scale was measured by just three items. The reliabilities for T4STBEH are generally good in all populations, with values above 0.600.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.182. Based on the measurement invariance testing results, comparisons of results across countries and territories on this scale are affected by substantial model fit issues in the most restricted multi-group model and must be interpreted with considerable caution.

Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4STBEH are presented in Table 11.183. Results by participating TKS country/territory show a low loading for item TT4G77F in Portugal and item TT4G77H in Morocco.

**Table 11.408. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4STBEH**

| Participating country/territory | Reliability      |
|---------------------------------|------------------|
|                                 | Cronbach's alpha |
| <b>TKS</b>                      |                  |
| Chile                           | 0.715            |
| Croatia                         | 0.711            |
| Morocco                         | 0.614            |
| Poland                          | 0.692            |

| Participating country/territory | Reliability      |
|---------------------------------|------------------|
|                                 | Cronbach's alpha |
| Portugal                        | 0.698            |
| Saudi Arabia                    | 0.781            |
| South Africa                    | 0.745            |
| United States                   | 0.684            |
| International pooled data       | 0.716            |

Source: OECD, TALIS 2024 database.

### Joy of teaching (T4JOYTCH)

The scale *Joy of teaching* (T4JOYTCH) was measured using a set of four items (TT4G80A, TT4G80B, TT4G80C and TT4G80D). These items assessed the level of agreement to different statements about teachers' experiences, including whether they like the subject(s) they teach, whether they often feel happy while teaching, whether they generally teach with enthusiasm, and whether they find satisfaction in the interesting challenges of teaching. Higher scores reflect greater joy of teaching.

Table 11.196 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities and model fit for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.409. The scale T4JOYTCH has high reliability (above 0.850) in all countries/territories. As can be seen in Table 11.409, the scale exhibits a good model fit based on all indices. The CFI, TLI and SRMR of T4JOYTCH are within the good cut-off criteria for all participants, while the RMSEA is within the acceptable cut-off for all participants.

Measurement invariance testing was based on the ISCED level 2 population of the core survey, presented in Table 11.198. Standardised item loadings and thresholds based on the pooled ISCED level 2 data for scale T4SEENG are presented in Table 11.199. All items show high loadings for the single TKS countries/territories.

**Table 11.409. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4JOYTCH**

| Participating country/territory | Reliability      | CFA model fit |       |       |       |
|---------------------------------|------------------|---------------|-------|-------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA | SRMR  |
| <b>TKS</b>                      |                  |               |       |       |       |
| Chile                           | 0.872            | 1.000         | 1.000 | 0.000 | 0.008 |
| Croatia                         | 0.913            | 0.997         | 0.991 | 0.083 | 0.017 |
| Morocco                         | 0.867            | 0.997         | 0.991 | 0.054 | 0.021 |
| Poland                          | 0.919            | 1.000         | 1.000 | 0.014 | 0.006 |
| Portugal                        | 0.868            | 0.999         | 0.998 | 0.029 | 0.011 |
| Saudi Arabia                    | 0.938            | 0.999         | 0.997 | 0.066 | 0.009 |
| South Africa                    | 0.891            | 1.000         | 0.999 | 0.025 | 0.009 |
| United States                   | 0.855            | 0.997         | 0.992 | 0.044 | 0.013 |
| International pooled data       | 0.882            | 0.999         | 0.998 | 0.030 | 0.008 |

Note. Coefficients in **bold** exceed the cut-off criteria.

Source: OECD, TALIS 2024 database.

### Opportunities to learn – Classroom instruction

The scale of *Opportunities to learn – Classroom instruction* (T4OTLCI) was constructed on the basis of teachers' responses to ten items (KTB4G111A, KTB4G111B, KTB4G111C, KTB4G111D, KTB4G111E, KTB4G111F, KTB4G111G, KTB4G111H, KTB4G111I and KTB4G111J). In these items, teachers had to indicate the extent to which their training or subsequent professional learning prepared them in various topics about classroom instruction. The available response options were "Not at all", "To some extent", "Quite a bit" and "A lot". Higher scores on this scale reflect greater opportunities available to teachers. Table 11.410 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.411. The scale T4OTLCI displayed high reliability (above 0.900) in all participating countries/territories. In terms of model fit, the CFI, TLI and SRMR are within the cut-off criteria for all participants, while the RMSEA exceeds the cut-off criteria in Croatia, Poland and Portugal.

Table 11.412 presents the results from the measurement invariance testing for KRBINS for TKS participating countries/territories. All indices, except the RMSEA, are within the cut-off criteria in the baseline invariance model. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off criteria for the TLI and RMSEA. No specific caution has to be made when comparing scale score results across countries/territories.

Table 11.413 presents the standardised item loadings and thresholds based on pooled TKS data for the scale T4OTLCI. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.410. Items and response categories used in the construction of scale T4OTLCI**

| Scale or item | Question or item wording                                                                                                                                                                                                                                    |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KRBINS        | To what extent has your formal teacher <education and training> or subsequent professional learning prepared you in the following topics related to classroom instruction?<br>1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot<br>Scale midpoint: 2.5 |
| KTB4G111A     | Lesson design (e.g. planning and structuring activities, lesson objectives and goals, phases and structure of the lesson)                                                                                                                                   |
| KTB4G111B     | Long-term planning (e.g. weekly, thematic unit planning, syllabuses)                                                                                                                                                                                        |
| KTB4G111C     | Time management in the classroom (e.g. optimising and prioritising instructional time, setting appropriate lesson pace, adapting the plan during the lesson)                                                                                                |
| KTB4G111D     | Student behaviour and classroom management (e.g. setting classroom rules and consequences, addressing classroom disruptions, identifying and addressing behavioural problems such as aggression, hyperactivity)                                             |
| KTB4G111E     | Collaborative learning (e.g. students working in small groups, sharing responsibility and working interdependently to complete a task)                                                                                                                      |
| KTB4G111F     | Adaptive teaching (e.g. individual assistance, internal differentiation, personalised instruction)                                                                                                                                                          |
| KTB4G111G     | Classroom discussion and dialogue (e.g. initiating, managing and promoting discussion/dialogue)                                                                                                                                                             |
| KTB4G111H     | Setting clear learning expectations (e.g. communicating expectations and goals for learning, clarifying success criteria for students)                                                                                                                      |
| KTB4G111I     | Student-centred approaches to learning (e.g. inquiry-based learning, problem/project-based learning, guided discovery)                                                                                                                                      |
| KTB4G111J     | Teaching clarity (e.g. explicit instruction, teacher modelling, teacher-guided practice)                                                                                                                                                                    |

Source: OECD, TALIS 2024 database.

**Table 11.411. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4OTLCI**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| <b>TKS</b>                      |                  |               |       |              |       |
| Chile                           | 0.933            | 0.946         | 0.930 | 0.100        | 0.055 |
| Croatia                         | 0.954            | 0.959         | 0.947 | <b>0.139</b> | 0.049 |
| Morocco                         | 0.924            | 0.955         | 0.942 | 0.078        | 0.052 |
| Poland                          | 0.946            | 0.951         | 0.937 | <b>0.119</b> | 0.060 |
| Portugal                        | 0.945            | 0.963         | 0.953 | <b>0.153</b> | 0.079 |
| Saudi Arabia                    | 0.969            | 0.986         | 0.981 | 0.090        | 0.024 |
| South Africa                    | 0.941            | 0.962         | 0.952 | 0.094        | 0.046 |
| United States                   | 0.943            | 0.983         | 0.979 | 0.064        | 0.030 |
| International pooled data       | 0.951            | 0.965         | 0.956 | 0.098        | 0.042 |

Note. Coefficients in **bold** exceed the cut-off criteria

Source: OECD, TALIS 2024 database.

**Table 11.412. Measurement invariance results from MGCFA for scale T4OTLCI with differences in model fits across models for TKS countries/territories**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>TKS</b>                    |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.965     | 0.955 | 0.109 | 0.049 | -                       | -      | -       | -      |
| Equal loadings                | 0.965     | 0.964 | 0.098 | 0.060 | 0.000                   | 0.009  | -0.011  | 0.010  |
| Equal loadings and thresholds | 0.949     | 0.962 | 0.101 | 0.108 | -0.016                  | -0.002 | 0.002   | 0.049  |

Source: OECD, TALIS 2024 database.

**Table 11.413. Item loadings and thresholds based on pooled TKS data for scale T4OTLCI**

| Item      | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|-----------|---------|-------------|-------------|-------------|
| KTb4G111A | 0.837   | -2.081      | -0.984      | -0.015      |
| KTb4G111B | 0.832   | -1.745      | -0.720      | 0.225       |
| KTb4G111C | 0.840   | -1.719      | -0.668      | 0.241       |
| KTb4G111D | 0.821   | -1.232      | -0.261      | 0.499       |
| KTb4G111E | 0.837   | -1.585      | -0.435      | 0.559       |
| KTb4G111F | 0.812   | -1.087      | -0.114      | 0.729       |
| KTb4G111G | 0.822   | -1.446      | -0.370      | 0.537       |
| KTb4G111H | 0.842   | -1.687      | -0.654      | 0.379       |
| KTb4G111I | 0.817   | -1.454      | -0.400      | 0.532       |
| KTb4G111J | 0.772   | -1.616      | -0.632      | 0.410       |

Source: OECD, TALIS 2024 database.

### Opportunities to learn – Student learning

The scale of *Opportunities to learn – Student learning* (T4OTLSL) was measured using a set of eight items (KTB4G121A, KTB4G121B, KTB4G121C, KTB4G121D, KTB4G121E, KTB4G121F, KTB4G121G and KTB4G121H). These items assessed the extent to which formal teacher training or subsequent professional learning prepared teachers in various topics related to student learning. For each item, teachers selected one of the following response options: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher scores on this scale reflect greater opportunities available to teachers. Table 11.414 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.415. The scale T4OTLSL has high reliability (above 0.900) in all participating countries/territories. In terms of model fit, the CFI, TLI and SRMR are within the cut-off criteria for all participants, while the RMSEA exceeds the cut-off criteria in Chile, Croatia, Portugal, Saudi Arabia and South Africa.

Table 11.416 presents the results from the measurement invariance testing for T4OTLSL for TKS participating countries/territories. All indices, except the RMSEA, are within the cut-off criteria in the baseline invariance model. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for all fit indices. However, it is close to the acceptable range for the TLI and RMSEA. No specific caution has to be made when comparing scale score results across countries/territories.

Table 11.417 presents the standardised item loadings and thresholds based on pooled TKS data for the scale T4OTLSL. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.414. Items and response categories used in the construction of scale T4OTLSL**

| Scale or item | Question or item wording                                                                                                                                                                                                                               |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KRBLEA        | To what extent has your formal teacher <education and training> or subsequent professional learning prepared you in the following topics related to student learning?<br>1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot<br>Scale midpoint: 2.5 |
| KTB4G121A     | Educational theories of learning (e.g. constructivism, behaviourism, cognitivism, social-constructivism)                                                                                                                                               |
| KTB4G121B     | Student individual differences (e.g. in prior knowledge, motivation, proficiency, interests)                                                                                                                                                           |
| KTB4G121C     | Identification of learning difficulties of students and interpretation of specialists' diagnoses (e.g. dyslexia, dysgraphia, attentional problems, etc.)                                                                                               |
| KTB4G121D     | Psychological theories of child development (e.g. Piaget, Maslow, Bronfenbrenner, Montessori, Vygotsky, Erikson, Kohlberg, etc.)                                                                                                                       |
| KTB4G121E     | Science of learning (e.g. cognitive processes underlying learning, such as memory, executive functions, attention controls, acquisition, storage and retrieval of knowledge, etc.)                                                                     |
| KTB4G121F     | Taxonomies of learning (e.g. Bloom's Taxonomy, Krathwohl's Affective Domain Taxonomy, Dreyfus Model of Skill Acquisition, SOLO Taxonomy)                                                                                                               |
| KTB4G121G     | Self-regulated learning (e.g. metacognitive learning strategies, comprehension-monitoring, goal-setting)                                                                                                                                               |
| KTB4G121H     | Affective-motivational impacts on learning (e.g. intrinsic/extrinsic motivation, self-efficacy, self-concept)                                                                                                                                          |

Source: OECD, TALIS 2024 database.



**Table 11.415. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4OTLSL**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| <b>TKS</b>                      |                  |               |       |              |       |
| Chile                           | 0.899            | 0.933         | 0.906 | <b>0.119</b> | 0.064 |
| Croatia                         | 0.924            | 0.967         | 0.954 | <b>0.120</b> | 0.040 |
| Morocco                         | 0.910            | 0.956         | 0.938 | 0.092        | 0.047 |
| Poland                          | 0.913            | 0.968         | 0.955 | 0.093        | 0.043 |
| Portugal                        | 0.914            | 0.947         | 0.925 | <b>0.143</b> | 0.054 |
| Saudi Arabia                    | 0.959            | 0.984         | 0.977 | <b>0.121</b> | 0.033 |
| South Africa                    | 0.923            | 0.957         | 0.940 | <b>0.105</b> | 0.043 |
| United States                   | 0.920            | 0.982         | 0.975 | 0.074        | 0.029 |
| International pooled data       | 0.930            | 0.971         | 0.960 | 0.097        | 0.038 |

Note. Coefficients in **bold** exceed the cut-off criteria

Source: OECD, TALIS 2024 database.

**Table 11.416. Measurement invariance results from MGCFA for scale T4OTLSL with differences in model fits across models for TKS countries/territories**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>TKS</b>                    |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.968     | 0.955 | 0.108 | 0.044 | -                       | -      | -       | -      |
| Equal loadings                | 0.975     | 0.973 | 0.084 | 0.049 | 0.007                   | 0.018  | -0.024  | 0.005  |
| Equal loadings and thresholds | 0.932     | 0.952 | 0.112 | 0.131 | -0.043                  | -0.021 | 0.028   | 0.082  |

Source: OECD, TALIS 2024 database.

**Table 11.417. Item loadings and thresholds based on pooled TKS data for scale T4OTLSL**

| Item      | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|-----------|---------|-------------|-------------|-------------|
| KTb4G121A | 0.772   | -1.524      | -0.376      | 0.604       |
| KTb4G121B | 0.827   | -1.700      | -0.529      | 0.465       |
| KTb4G121C | 0.756   | -1.085      | -0.088      | 0.715       |
| KTb4G121D | 0.751   | -1.234      | -0.158      | 0.755       |
| KTb4G121E | 0.839   | -1.415      | -0.218      | 0.785       |
| KTb4G121F | 0.725   | -1.056      | -0.140      | 0.756       |
| KTb4G121G | 0.864   | -1.311      | -0.143      | 0.822       |
| KTb4G121H | 0.842   | -1.421      | -0.288      | 0.647       |

Source: OECD, TALIS 2024 database.

### Opportunities to learn – Assessment

The scale of *Opportunities to learn – Assessment* (T4OTLAS) was measured using a set of nine items (KTb4G131A, KTB4G131B, KTB4G131C, KTB4G131D, KTB4G131E, KTB4G131F, KTB4G131G,

KTB4G131H and KTB4G131I). These items assessed the extent to which formal teacher training or subsequent professional learning prepared teachers in various topics related to assessment. For each item, teachers selected one of the following response options: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher scores on this scale reflect greater opportunities available to teachers. Table 11.418 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.419. The scale T4OTLAS has high reliability (above 0.900) in all participating countries/territories. In terms of model fit, the CFI, TLI and SRMR are within the cut-off criteria for good model fit for all participants, while the RMSEA exceeds the acceptable cut-off criteria in Croatia, Poland and Saudi Arabia.

Table 11.420 presents the results from the measurement invariance testing for T4OTLAS for TKS participating countries/territories. All indices are within the cut-off criteria in the baseline invariance model. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models exceeds the cut-off criteria for the CFI and SRMR and is close to the cut-off for the TLI and RMSEA. No specific caution has to be made when comparing scale score results across countries/territories.

Table 11.421 presents the standardised item loadings and thresholds based on pooled TKS data for the scale T4OTLAS. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.418. Items and response categories used in the construction of scale T4OTLAS**

| Scale or item | Question or item wording                                                                                                                                                                                                                         |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KRBASS        | To what extent has your formal teacher <education and training> or subsequent professional learning prepared you in the following topics related to assessment?<br>1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot<br>Scale midpoint: 2.5 |
| KTb4G131A     | Different purposes for assessment (e.g. diagnostic, formative, summative)                                                                                                                                                                        |
| KTb4G131B     | Standards used to assess students (e.g. individual, social, norm-referenced, criterion-referenced)                                                                                                                                               |
| KTb4G131C     | Creating and using rubrics for assessment of students' work                                                                                                                                                                                      |
| KTb4G131D     | Peer and/or self-assessment (e.g. students assessing other students or assessing themselves on their work, their performance or their input into tasks)                                                                                          |
| KTb4G131E     | Standardised tests (e.g. national and international tests)                                                                                                                                                                                       |
| KTb4G131F     | Grades and grading (e.g. how to assign grades, reporting grades to parents, uses and functions, advantages, limitations)                                                                                                                         |
| KTb4G131G     | Providing effective feedback to students (e.g. appropriate form, focus and detail of feedback)                                                                                                                                                   |
| KTb4G131H     | Data literacy (e.g. analysing and interpreting assessment data such as test results, data about students' attitudes and perceptions, etc.)                                                                                                       |
| KTb4G131I     | Monitoring learning progress (e.g. using assessments and analysing assessment data to check if students are making learning progress)                                                                                                            |

Source: OECD, TALIS 2024 database.

**Table 11.419. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4OTLAS**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| <b>TKS</b>                      |                  |               |       |              |       |
| Chile                           | 0.929            | 0.962         | 0.949 | 0.093        | 0.041 |
| Croatia                         | 0.955            | 0.974         | 0.966 | <b>0.136</b> | 0.039 |
| Morocco                         | 0.904            | 0.961         | 0.947 | 0.078        | 0.046 |
| Poland                          | 0.954            | 0.977         | 0.970 | <b>0.113</b> | 0.034 |
| Portugal                        | 0.933            | 0.981         | 0.974 | 0.098        | 0.031 |
| Saudi Arabia                    | 0.965            | 0.985         | 0.980 | <b>0.109</b> | 0.024 |
| South Africa                    | 0.940            | 0.964         | 0.953 | 0.100        | 0.051 |
| United States                   | 0.946            | 0.976         | 0.968 | 0.091        | 0.036 |
| International pooled data       | 0.948            | 0.977         | 0.970 | 0.092        | 0.030 |

Note. Coefficients in **bold** exceed the cut-off criteria

Source: OECD, TALIS 2024 database.

**Table 11.420. Measurement invariance results from MGCFA for scale T4OTLAS with differences in model fits across models for TKS countries/territories**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>TKS</b>                    |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.978     | 0.971 | 0.100 | 0.038 | -                       | -      | -       | -      |
| Equal loadings                | 0.980     | 0.979 | 0.085 | 0.044 | 0.002                   | 0.008  | -0.015  | 0.007  |
| Equal loadings and thresholds | 0.963     | 0.973 | 0.097 | 0.099 | -0.017                  | -0.006 | 0.012   | 0.054  |

Source: OECD, TALIS 2024 database.

**Table 11.421. Item loadings and thresholds based on pooled TKS data for scale T4OTLAS**

| Item      | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|-----------|---------|-------------|-------------|-------------|
| KTb4G131A | 0.800   | -1.844      | -0.789      | 0.242       |
| KTb4G131B | 0.836   | -1.504      | -0.402      | 0.577       |
| KTb4G131C | 0.829   | -1.385      | -0.446      | 0.489       |
| KTb4G131D | 0.800   | -1.401      | -0.300      | 0.678       |
| KTb4G131E | 0.720   | -1.014      | -0.096      | 0.739       |
| KTb4G131F | 0.815   | -1.362      | -0.424      | 0.523       |
| KTb4G131G | 0.839   | -1.503      | -0.525      | 0.405       |
| KTb4G131H | 0.877   | -1.342      | -0.321      | 0.607       |
| KTb4G131I | 0.901   | -1.517      | -0.483      | 0.523       |
| KTb4G131A | 0.800   | -1.844      | -0.789      | 0.242       |

Source: OECD, TALIS 2024 database.

### Opportunities to learn – Additional pedagogical topics

The scale of *Opportunities to learn – Additional pedagogical topics* (T4OTLAP) was measured using a set of 11 items (KTB4G141A, KTB4G141B, KTB4G141C, KTB4G141D, KTB4G141E, KTB4G141F, KTB4G141G, KTB4G141H, KTB4G141I, KTB4G141J and KTB4G141K). These items assessed the extent to which formal teacher training or subsequent professional learning prepared teachers in various topics related to pedagogy. For each item, teachers selected one of the following response options: “Not at all”, “To some extent”, “Quite a bit” and “A lot”. Higher scores on this scale reflect greater opportunities available to teachers. Table 11.422 provides the item names, question stem, item statements and response options for the items belonging to this scale.

Scale reliabilities for all TKS participating countries/territories as well as for the pooled TKS model are presented in Table 11.423. The scale T4OTLAP has high reliability (above 0.900) in all participating countries/territories. In terms of model fit, the CFI, TLI and SRMR are within the acceptable cut-off criteria. The RMSEA exceeds the cut-off criteria in the pooled model, as well as in the models for Croatia, Poland, Portugal, Saudi Arabia and the United States.

Table 11.424 presents the results from the measurement invariance testing for T4OTLAP for TKS participating countries/territories. The CFI, TLI and SRMR are within the cut-off criteria in the baseline invariance model, while the RMSEA exceeds the cut-off. The degree of change between the baseline and equal loadings model is within the cut-off criteria for all fit indices. The degree of change between the equal loadings and the equal loadings and thresholds models is within the cut-off for the RMSEA, close to the cut-off for the TLI and exceeds the cut-off criteria for the CFI and SRMR. No specific caution has to be made when comparing scale score results across countries/territories.

Table 11.425 presents the standardised item loadings and thresholds based on pooled TKS data for the scale T4OTLAP. All items show high loadings for the pooled model as well as in single countries/territories.

**Table 11.422. Items and response categories used in the construction of scale T4OTLAP**

| Scale or item | Question or item wording                                                                                                                                                                                                                                  |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KRBEPR        | To what extent has your formal teacher <education and training> or subsequent professional learning prepared you in the following additional topics related to pedagogy?<br>1=Not at all; 2=To some extent; 3=Quite a bit; 4=A lot<br>Scale midpoint: 2.5 |
| KTB4G141A     | Teaching in a multicultural setting                                                                                                                                                                                                                       |
| KTB4G141B     | Teaching in a multilingual setting                                                                                                                                                                                                                        |
| KTB4G141C     | Teaching students from socio-economically disadvantaged homes                                                                                                                                                                                             |
| KTB4G141D     | Methods and interventions for inclusion and inclusive pedagogies (e.g. methods for making students from minority backgrounds feel more included in the learning and preventing and dealing with discrimination and bullying based on these factors)       |
| KTB4G141E     | Accommodating students with special education needs (e.g. dyslexia, dysgraphia, attentional problems, autism, hearing impairment, etc.)                                                                                                                   |
| KTB4G141F     | Identifying and/or meeting the learning needs of gifted students                                                                                                                                                                                          |
| KTB4G141G     | Teaching cross-disciplinary skills (e.g. creativity, critical thinking, complex problem solving, collaboration)                                                                                                                                           |
| KTB4G141H     | Using <digital resources and tools> in instruction (e.g. approaches to using Internet, software tools and computers/digital devices for teaching and learning)                                                                                            |
| KTB4G141I     | Classroom climate (e.g. the physical and social environment of the classroom)                                                                                                                                                                             |
| KTB4G141J     | Students' social and emotional development (e.g. emotion regulation, self-esteem, self-efficacy, respect for others, communicating and interacting with others)                                                                                           |
| KTB4G141K     | Identifying and intervening when students display emotional problems (e.g. stress, anxiety, traumatic event, family dysfunction, victimisation)                                                                                                           |

Source: OECD, TALIS 2024 database.

**Table 11.423. Reliability coefficient alpha and CFA model fits for single countries and pooled model for scale T4OTLAP**

| Participating country/territory | Reliability      | CFA model fit |       |              |       |
|---------------------------------|------------------|---------------|-------|--------------|-------|
|                                 | Cronbach's alpha | CFI           | TLI   | RMSEA        | SRMR  |
| <b>TKS</b>                      |                  |               |       |              |       |
| Chile                           | 0.933            | 0.955         | 0.944 | 0.099        | 0.054 |
| Croatia                         | 0.956            | 0.962         | 0.953 | <b>0.140</b> | 0.058 |
| Morocco                         | 0.927            | 0.949         | 0.937 | 0.089        | 0.053 |
| Poland                          | 0.946            | 0.948         | 0.936 | <b>0.129</b> | 0.084 |
| Portugal                        | 0.950            | 0.960         | 0.950 | <b>0.141</b> | 0.047 |
| Saudi Arabia                    | 0.958            | 0.953         | 0.941 | <b>0.144</b> | 0.059 |
| South Africa                    | 0.945            | 0.961         | 0.952 | 0.095        | 0.069 |
| United States                   | 0.939            | 0.937         | 0.921 | <b>0.129</b> | 0.064 |
| International pooled data       | 0.951            | 0.958         | 0.947 | <b>0.114</b> | 0.051 |

Note. Coefficients in **bold** exceed the cut-off criteria

Source: OECD, TALIS 2024 database.

**Table 11.424. Measurement invariance results from MGCFA for scale T4OTLAP with differences in model fits across models for TKS countries/territories**

| Invariance model              | Model fit |       |       |       | Difference in model fit |        |         |        |
|-------------------------------|-----------|-------|-------|-------|-------------------------|--------|---------|--------|
|                               | CFI       | TLI   | RMSEA | SRMR  | Δ CFI                   | Δ TLI  | Δ RMSEA | Δ SRMR |
| <b>TKS</b>                    |           |       |       |       |                         |        |         |        |
| Baseline                      | 0.958     | 0.947 | 0.118 | 0.061 | -                       | -      | -       | -      |
| Equal loadings                | 0.962     | 0.960 | 0.102 | 0.073 | 0.004                   | 0.013  | -0.016  | 0.012  |
| Equal loadings and thresholds | 0.939     | 0.953 | 0.111 | 0.124 | -0.023                  | -0.007 | 0.009   | 0.051  |

Source: OECD, TALIS 2024 database.

**Table 11.425. Item loadings and thresholds based on pooled TKS data for scale T4OTLAP**

| Item      | Loading | Threshold 1 | Threshold 2 | Threshold 3 |
|-----------|---------|-------------|-------------|-------------|
| KTb4G141A | 0.822   | -0.791      | 0.086       | 0.820       |
| KTb4G141B | 0.773   | -0.376      | 0.465       | 1.084       |
| KTb4G141C | 0.819   | -0.948      | -0.027      | 0.732       |
| KTb4G141D | 0.859   | -0.955      | -0.024      | 0.706       |
| KTb4G141E | 0.780   | -0.951      | 0.011       | 0.793       |
| KTb4G141F | 0.819   | -0.907      | -0.011      | 0.762       |
| KTb4G141G | 0.810   | -1.410      | -0.296      | 0.671       |
| KTb4G141H | 0.644   | -1.252      | -0.297      | 0.567       |
| KTb4G141I | 0.829   | -1.409      | -0.372      | 0.642       |
| KTb4G141J | 0.905   | -1.448      | -0.395      | 0.532       |
| KTb4G141K | 0.893   | -1.142      | -0.167      | 0.629       |

Source: OECD, TALIS 2024 database.

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## Notes

<sup>1</sup> Numbering refers to the ISCED levels 2 and 3 principal questionnaires.

<sup>2</sup> The factor loadings presented in the report are based on the pooled model. However, during the scale evaluation process, values for individual countries/territories were also examined. Only countries/territories and items that fall below the established factor loadings cut-offs are reported on.

<sup>3</sup> Notes on reliability are shown only for three-item scales, as reliability is the only criterion available for these scales. For scales with more than three items, reliability is considered alongside the four model-fit indices in each country/territory.



# 12 **Scaling analysis of items measuring general pedagogical knowledge**

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This document summarises the psychometric analyses conducted on the general pedagogical knowledge (GPK) assessment developed for the Teaching and Learning International Survey (TALIS) 2024 Teacher Knowledge Survey (TKS). The analyses – carried out by the Australian Council for Educational Research – informed item selection, scaling and the development of a described GPK scale. Advanced psychometric models, such as the two-parameter logistic model and the Generalized Partial Credit Model, were employed for item calibration and scaling. Differential item functioning and cross-national comparability were also examined. Key areas of focus included item-level performance, dimensionality of the scale, reliability and measurement invariance across countries and gender. Missing data patterns and test targeting were reviewed to ensure data quality. The final scale enables robust cross-country comparisons and meaningful interpretation of teachers' GPK proficiency.

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## 12.1. Overview

This chapter describes the analysis and scaling procedures for the main survey data from the Teaching and Learning International Survey (TALIS) 2024 Teacher Knowledge Survey (TKS) assessment of general pedagogical knowledge (GPK). Data from the eight participating countries were received by the Australian Council for Educational Research (ACER) after cleaning and processing by the International Association for the Evaluation of Educational Achievement (IEA). In a first step, ACER conducted an exhaustive analysis of these data prior to their final scaling. At various points in the process, these analyses were discussed with and vetted by the TALIS Technical Advisory Group and the Teacher Knowledge Expert Group whose advice and feedback informed further analysis and final scaling procedures.

The following types of analysis were undertaken:

- review of percentages of missing data
- log data analysis, such as time per item and time per whole test
- investigation of the factorial structure of the GPK scale using multi-dimensional item response theory (IRT) models
- review of test reliability (IRT-based) for the overall GPK scale and potential sub-scales
- analyses based on IRT and classical test theory to examine item and test performance, such as:
  - item facility
  - adjusted (rest) and non-adjusted item-total correlation
  - item fit (weighted infit mean square [MNSQ])
  - mean latent construct estimates for respondents (per each question/item)
  - key and distractor analyses
  - item characteristic curves
- differential item functioning (DIF):
  - by gender
  - by country.

The analyses and scaling procedures were conducted using appropriate sampling weights for all TKS teacher data. For analyses and calibrations based on data from the combined international<sup>1</sup> sample, so called “senate weights” were used to ensure that each of the eight participating education systems contributed to the results with the same weight.

## 12.2. Scaling model

Following best practice in other international large-scale assessments, IRT was used for the scaling of GPK assessment items. The ACER ConQuest software (Adams et al., 2020<sup>[1]</sup>) was used for analysis and scaling, applying the two-parameter logistic (2PL) model and Generalized Partial Credit Model (Muraki, 1992<sup>[2]</sup>).

For dichotomously scored items (e.g. correct vs. incorrect), the 2PL models the probability of obtaining a correct response  $x_i = 1$  as:

$$P_i(x_i = 1 | \theta_n, \alpha_i, \delta_i) = \frac{\exp(\alpha_i(\theta_n - \delta_i))}{1 + \exp(\alpha_i(\theta_n - \delta_i))}$$

Here,  $P_i(x_i = 1|\theta_n, \alpha_i, \delta_i)$  is the probability of person  $n$  scoring 1 on item  $i$ ,  $\theta_n$  is the estimated latent trait of person  $n$ ,  $\alpha_i$  is the estimated location of item  $i$  on this dimension and  $\alpha_i$  is a discrimination (slope) parameter. For each item, item responses are modelled as a function of the latent trait  $\theta_n$ .

For items with more than two categories, the model becomes the Generalized Partial Credit Model,

$$P_i(x_i|\theta_n, \alpha_i, \delta_i, \tau_{ik}) = \frac{\exp \sum_{k=0}^x \alpha_i(\theta_n - \delta_i + \tau_{ik})}{\sum_{h=0}^{m_i} \exp \sum_{k=0}^h \alpha_i(\theta_n - \delta_i + \tau_{ik})}, x_i = 1, 2, \dots, m_i$$

Here,  $P_i(x_i|\theta_n, \alpha_i, \delta_i, \tau_{ik})$  denotes the probability of individual  $n$  score  $x_i$  on item  $i$ ,  $\theta_n$  is the estimated latent trait for respondent  $n$ ,  $\alpha_i$  is a discrimination (slope) parameter for item  $i$ ,  $\delta_i$  is an item parameter which indicates the location of the item  $i$  on the latent continuum and  $\tau_{ik}$  is a parameter indicating step  $k$  for item  $i$ .

### 12.3. Targeting and test reliability

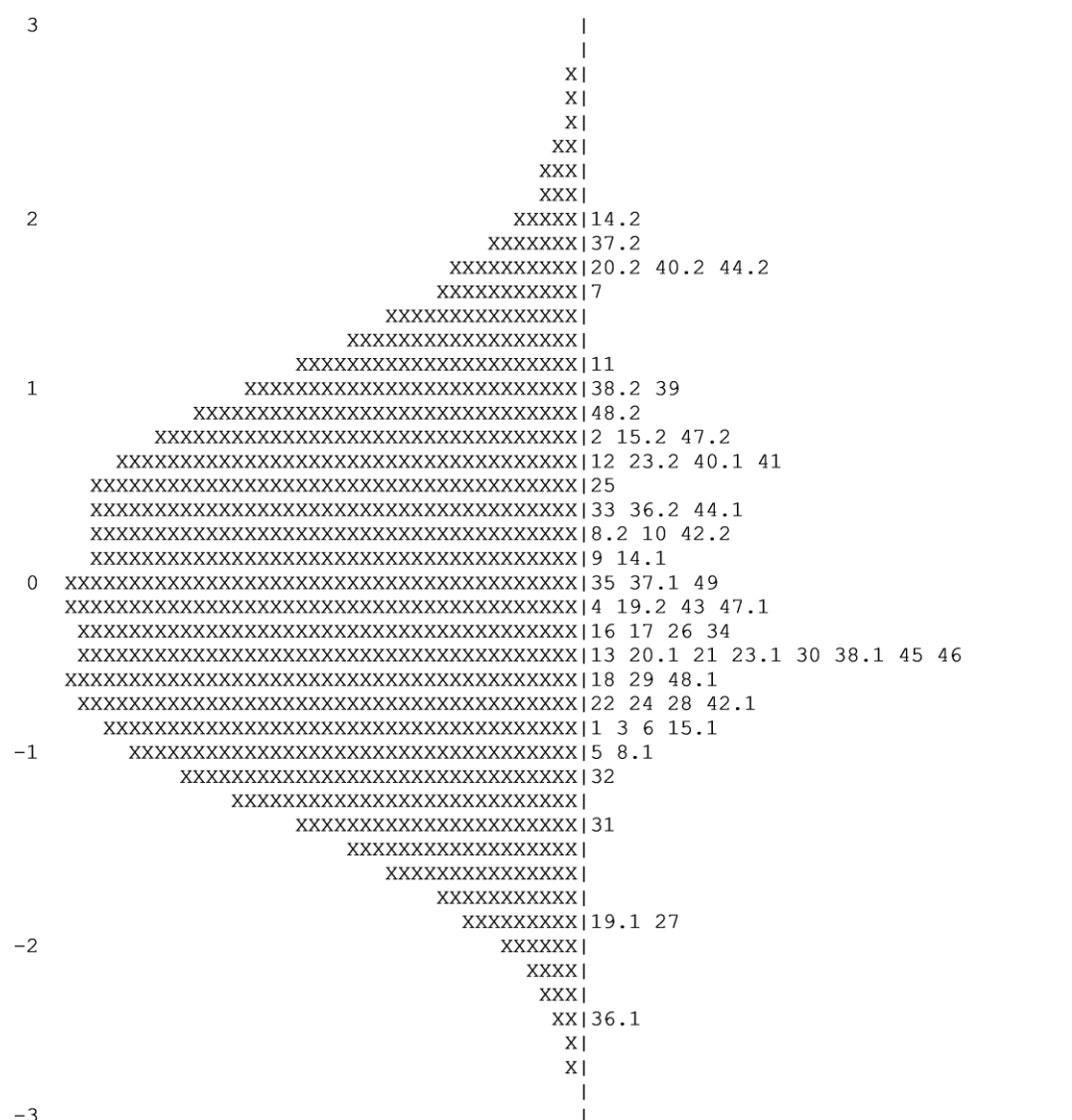
The targeting of the assessment was reviewed by comparing the range of item difficulties and the range of GPK amongst assessed teachers in the main survey. Further, the reliability of the assessment was computed based on IRT measures (plausible value reliability estimate), which was satisfactory across national samples and for the international sample (Table 12.1).

**Table 12.1. Reliabilities of assessment items**

| Sample               | Weighted reliability estimate |
|----------------------|-------------------------------|
| Chile                | 0.80                          |
| Croatia              | 0.83                          |
| Morocco              | 0.75                          |
| Poland               | 0.81                          |
| Portugal             | 0.75                          |
| Saudi Arabia         | 0.77                          |
| South Africa         | 0.82                          |
| United States        | 0.75                          |
| International sample | 0.86                          |

When measuring knowledge domains with an assessment, it is important to use assessment items that cover the range of knowledge found in the target population. To review this coverage, the distribution of GPK and the location of item parameters (with a response probability of 0.5) were estimated based on the 49 items that were selected for scaling (Figure 12.1). Item thresholds were equal to item difficulties for dichotomous items. For partial credit items, a difficulty threshold was estimated for each score, indicated by the 0.1 and 0.2 appended to the item number. This mapping comparing teacher knowledge and item thresholds is known as a Wright Map.<sup>2</sup> The map illustrates that, generally, the assessment items covered the range of teachers' GPK measured in participating countries. However, there were fewer items describing lower as well as higher levels of GPK.

Figure 12.1. Wright map of GPK assessment items



## 12.4. Review of missing data

Three possible types of non-response could appear in the GPK assessment data:

4. **Omitted items** (coded as 9): items to which a respondent was exposed, but for which no response was entered.
5. **Not-administered items** (coded as 8): items to which a respondent was not exposed. Most commonly, this is due to the rotated cluster design of the assessment, by which respondents were assigned to different clusters of items.
6. **Not-reached items** (coded as 7): a derived category of non-response based on evidence from strings of omitted items at the end of a test form completed by a respondent. If the final valid response in a test form completed by a respondent was followed by more than two omitted responses, the first omitted response remained coded as 9 while all remaining trailing omitted responses were deemed to have been not reached and were recoded accordingly.

Not-reached and not-administered items (categories 7 and 8) were not included in the analyses and scaling of GPK items. On average, between 5% and 6% of GPK item responses were coded as not-reached in the international sample; however, the percentages ranged from 1.3% in Poland to 13.9% in the United States (Table 12.2). As items were included in three different positions across the four booklets, drop-out effects due to fatigue or other reasons tended to be equally spread across assessment items. The GPK assessment was not timed (i.e. respondents could take up to 24 hours to complete both the context questionnaire and the GPK assessment) and responses in the not-reached category were treated as missing information for the analyses and scaling of GPK data.

**Table 12.2. Percentages of not-reached responses**

| Item      | Chile | Croatia | Morocco | Poland | Portugal | Saudi Arabia | United States | South Africa |
|-----------|-------|---------|---------|--------|----------|--------------|---------------|--------------|
| KTN4G69D1 | 5.9   | 3.8     | 2.8     | 1.0    | 4.2      | 4.2          | 13.6          | 7.1          |
| KTN4G79C1 | 5.9   | 3.8     | 2.8     | 1.0    | 4.3      | 4.2          | 13.8          | 7.2          |
| KTN4G32F1 | 5.4   | 3.6     | 2.3     | 0.7    | 3.9      | 3.7          | 13.4          | 6.7          |
| KTN4G31C1 | 7.8   | 3.5     | 2.2     | 1.3    | 5.1      | 4.1          | 14.5          | 6.4          |
| KTN4G47E1 | 5.5   | 3.8     | 2.5     | 0.8    | 4.0      | 3.8          | 13.4          | 6.7          |
| KTN4G34H1 | 8.0   | 4.3     | 2.4     | 1.4    | 4.1      | 3.7          | 12.5          | 6.6          |
| KTN4G54H1 | 7.9   | 3.3     | 2.9     | 1.2    | 4.4      | 4.0          | 12.9          | 6.1          |
| KTN4G591  | 7.7   | 4.2     | 2.3     | 1.4    | 3.9      | 3.6          | 12.4          | 6.4          |
| KTN4G43E1 | 8.7   | 5.0     | 2.7     | 1.7    | 4.8      | 4.3          | 14.2          | 7.3          |
| KTN4G46E1 | 7.1   | 3.5     | 2.2     | 1.2    | 4.9      | 4.1          | 14.4          | 6.3          |
| KTN4G751  | 7.4   | 4.3     | 2.9     | 1.4    | 5.0      | 4.9          | 15.1          | 8.0          |
| KTN4G401  | 8.5   | 3.8     | 2.3     | 1.8    | 5.4      | 4.2          | 14.9          | 6.6          |
| KTN4G50S1 | 7.3   | 4.2     | 2.3     | 1.3    | 3.9      | 3.6          | 12.1          | 6.3          |
| KTN4G681  | 8.1   | 4.4     | 2.6     | 1.4    | 4.1      | 3.7          | 12.7          | 6.6          |
| KTN4G711  | 8.6   | 4.5     | 3.0     | 1.5    | 5.3      | 5.2          | 16.5          | 8.5          |
| KTN4G49E1 | 6.2   | 4.0     | 2.8     | 1.2    | 4.5      | 4.3          | 14.3          | 7.3          |
| KTN4G44U1 | 7.2   | 4.0     | 2.3     | 1.2    | 3.8      | 3.6          | 12.0          | 6.3          |
| KTN4G70E1 | 6.5   | 4.1     | 2.8     | 1.2    | 4.6      | 4.4          | 14.4          | 7.4          |
| KTN4G601  | 7.8   | 3.2     | 2.9     | 1.2    | 4.1      | 4.0          | 12.7          | 6.0          |
| KTN4G561  | 8.8   | 3.7     | 3.0     | 1.5    | 4.5      | 4.3          | 15.1          | 6.3          |
| KTN4G78Q1 | 8.3   | 3.8     | 2.2     | 1.5    | 5.2      | 4.2          | 14.9          | 6.5          |
| KTN4G36A1 | 6.7   | 3.1     | 2.1     | 1.0    | 4.4      | 3.4          | 13.1          | 5.8          |
| KTN4G301  | 7.2   | 3.2     | 2.8     | 1.2    | 3.9      | 4.0          | 12.4          | 5.8          |
| KTN4G53G1 | 6.7   | 3.2     | 2.1     | 1.0    | 4.4      | 3.6          | 13.4          | 5.8          |
| KTN4G52I1 | 8.0   | 3.6     | 2.9     | 1.2    | 4.4      | 4.2          | 13.2          | 6.2          |
| KTN4G35D1 | 8.4   | 3.6     | 2.9     | 1.5    | 4.5      | 4.2          | 13.3          | 6.3          |
| KTN4G61A1 | 6.9   | 3.6     | 2.2     | 1.1    | 3.6      | 3.5          | 11.6          | 5.8          |
| KTN4G73L1 | 7.0   | 3.6     | 2.2     | 1.1    | 3.7      | 3.5          | 11.7          | 5.9          |
| KTN4G29T1 | 6.9   | 3.4     | 2.1     | 1.0    | 4.5      | 3.6          | 14.0          | 5.8          |
| KTN4G66R1 | 6.7   | 4.1     | 2.9     | 1.2    | 4.7      | 4.6          | 14.5          | 7.7          |
| KTN4G55F1 | 7.2   | 3.2     | 2.8     | 1.1    | 3.9      | 4.0          | 12.4          | 5.8          |
| KTN4G77O1 | 7.2   | 3.2     | 2.8     | 1.1    | 3.9      | 3.8          | 12.4          | 5.8          |
| KTN4G45T1 | 7.8   | 3.2     | 2.8     | 1.2    | 4.0      | 4.0          | 12.5          | 6.0          |

| Item      | Chile | Croatia | Morocco | Poland | Portugal | Saudi Arabia | United States | South Africa |
|-----------|-------|---------|---------|--------|----------|--------------|---------------|--------------|
| KTN4G42T1 | 9.2   | 3.7     | 3.2     | 1.6    | 4.8      | 4.3          | 15.1          | 6.5          |
| KTN4G28A1 | 9.2   | 3.7     | 3.1     | 1.5    | 4.8      | 4.3          | 15.1          | 6.4          |
| KTN4G41T1 | 8.5   | 4.8     | 2.7     | 1.6    | 4.5      | 3.9          | 13.1          | 7.0          |
| KTN4G761  | 7.1   | 4.3     | 2.9     | 1.2    | 4.9      | 4.7          | 14.9          | 7.7          |
| KTN4G651  | 9.3   | 3.7     | 3.2     | 1.6    | 4.8      | 4.4          | 15.2          | 6.5          |
| KTN4G721  | 7.1   | 3.4     | 2.1     | 1.0    | 4.5      | 3.8          | 14.2          | 5.9          |
| KTN4G581  | 8.7   | 4.9     | 2.7     | 1.7    | 4.7      | 4.1          | 14.1          | 7.1          |
| KTN4G631  | 8.4   | 4.7     | 2.7     | 1.5    | 4.2      | 3.8          | 13.1          | 6.9          |
| KTN4G51S1 | 8.5   | 4.4     | 3.0     | 1.5    | 5.3      | 5.1          | 15.2          | 8.5          |
| KTN4G371  | 5.6   | 3.8     | 2.6     | 0.9    | 4.1      | 3.9          | 13.5          | 6.9          |
| KTN4G39A1 | 9.5   | 3.7     | 3.3     | 1.6    | 5.0      | 4.5          | 15.6          | 6.5          |
| KTN4G641  | 9.3   | 4.2     | 2.3     | 2.0    | 5.6      | 4.7          | 15.6          | 7.1          |
| KTN4G741  | 8.0   | 3.6     | 2.2     | 1.5    | 5.1      | 4.1          | 14.9          | 6.5          |
| KTN4G48P1 | 8.8   | 5.1     | 2.8     | 1.7    | 4.9      | 4.3          | 14.9          | 7.3          |
| KTN4G67S1 | 8.6   | 3.9     | 2.3     | 1.8    | 5.5      | 4.4          | 14.9          | 6.8          |
| KTN4G381  | 8.6   | 4.0     | 2.3     | 1.8    | 5.5      | 4.4          | 15.0          | 6.8          |
| KTN4G621  | 7.0   | 3.9     | 2.2     | 1.1    | 3.8      | 3.6          | 12.0          | 5.9          |
| KTN4G57R1 | 8.0   | 4.4     | 3.0     | 1.4    | 5.3      | 5.1          | 15.2          | 8.2          |
| KTN4G33D1 | 9.0   | 4.0     | 2.3     | 1.9    | 5.6      | 4.4          | 15.3          | 6.9          |
| Average   | 7.7   | 3.9     | 2.6     | 1.3    | 4.5      | 4.1          | 13.9          | 6.7          |

There were relatively low percentages of omitted responses for individual<sup>3</sup> GPK items, when not administered and not-reached responses were treated as missing information (Table 12.3). On average, 1.6% of responses were omitted; complex multiple-choice (CMC) items were more likely to be omitted (1.9%) than simple multiple-choice (SMC) items (1.1%).

**Table 12.3. Percentages of omitted responses for individual items**

| Item      | Type | % omitted | Item      | Type | % omitted | Item      | Type | % omitted |
|-----------|------|-----------|-----------|------|-----------|-----------|------|-----------|
| KTO4G61A1 | SMC  | 0.8       | KTO4G31C1 | SMC  | 0.9       | KTO4G561B | CMC  | 3.1       |
| KTO4G73L1 | SMC  | 0.7       | KTO4G741A | CMC  | 1.3       | KTO4G561C | CMC  | 3.5       |
| KTO4G621A | CMC  | 3.6       | KTO4G741B | CMC  | 1.9       | KTO4G561D | CMC  | 2.6       |
| KTO4G621B | CMC  | 3.9       | KTO4G741C | CMC  | 2.2       | KTO4G28A1 | SMC  | 0.7       |
| KTO4G621C | CMC  | 2.6       | KTO4G741D | CMC  | 2.0       | KTO4G42T1 | SMC  | 0.9       |
| KTO4G621D | CMC  | 2.9       | KTO4G741E | CMC  | 2.0       | KTO4G651A | CMC  | 1.8       |
| KTO4G44U1 | SMC  | 1.7       | KTO4G78Q1 | SMC  | 1.1       | KTO4G651B | CMC  | 1.8       |
| KTO4G50S1 | SMC  | 1.5       | KTO4G401A | CMC  | 1.8       | KTO4G651C | CMC  | 1.5       |
| KTO4G591A | CMC  | 1.3       | KTO4G401B | CMC  | 1.8       | KTO4G651D | CMC  | 1.9       |
| KTO4G591B | CMC  | 1.7       | KTO4G401C | CMC  | 2.2       | KTO4G39A1 | SMC  | 0.9       |
| KTO4G591C | CMC  | 1.5       | KTO4G67S1 | SMC  | 0.9       | KTO4G32F1 | SMC  | 0.9       |
| KTO4G591D | CMC  | 1.4       | KTO4G381A | CMC  | 1.2       | KTO4G47E1 | SMC  | 1.0       |
| KTO4G34H1 | SMC  | 0.9       | KTO4G381B | CMC  | 1.5       | KTO4G371A | CMC  | 1.2       |
| KTO4G681A | CMC  | 1.7       | KTO4G381C | CMC  | 1.7       | KTO4G371B | CMC  | 1.1       |
| KTO4G681B | CMC  | 1.9       | KTO4G381D | CMC  | 1.7       | KTO4G371C | CMC  | 1.3       |

| Item      | Type | % omitted | Item      | Type | % omitted | Item      | Type | % omitted |
|-----------|------|-----------|-----------|------|-----------|-----------|------|-----------|
| KTO4G681C | CMC  | 1.7       | KTO4G381E | CMC  | 1.5       | KTO4G371D | CMC  | 1.3       |
| KTO4G681D | CMC  | 1.9       | KTO4G33D1 | SMC  | 1.8       | KTO4G69D1 | SMC  | 0.7       |
| KTO4G631A | CMC  | 2.0       | KTO4G641A | CMC  | 1.4       | KTO4G79C1 | SMC  | 2.0       |
| KTO4G631B | CMC  | 2.1       | KTO4G641B | CMC  | 1.4       | KTO4G49E1 | SMC  | 1.0       |
| KTO4G631C | CMC  | 2.2       | KTO4G641C | CMC  | 2.0       | KTO4G70E1 | SMC  | 0.8       |
| KTO4G631D | CMC  | 2.1       | KTO4G77O1 | SMC  | 0.8       | KTO4G66R1 | SMC  | 0.8       |
| KTO4G41T1 | SMC  | 2.2       | KTO4G55F1 | SMC  | 0.5       | KTO4G761A | CMC  | 1.4       |
| KTO4G581A | CMC  | 1.7       | KTO4G301A | CMC  | 1.5       | KTO4G761B | CMC  | 1.8       |
| KTO4G581B | CMC  | 1.6       | KTO4G301B | CMC  | 1.5       | KTO4G761C | CMC  | 1.8       |
| KTO4G581C | CMC  | 2.0       | KTO4G301C | CMC  | 1.6       | KTO4G761D | CMC  | 1.6       |
| KTO4G43E1 | SMC  | 1.5       | KTO4G301D | CMC  | 1.7       | KTO4G751A | CMC  | 2.1       |
| KTO4G48P1 | SMC  | 0.9       | KTO4G45T1 | SMC  | 2.0       | KTO4G751B | CMC  | 1.6       |
| KTO4G36A1 | SMC  | 0.9       | KTO4G601A | CMC  | 0.9       | KTO4G751C | CMC  | 2.2       |
| KTO4G53G1 | SMC  | 1.0       | KTO4G601B | CMC  | 1.4       | KTO4G57R1 | SMC  | 1.2       |
| KTO4G29T1 | SMC  | 0.7       | KTO4G601C | CMC  | 1.3       | KTO4G51S1 | SMC  | 1.2       |
| KTO4G721A | CMC  | 2.4       | KTO4G601D | CMC  | 1.8       | KTO4G711A | CMC  | 1.7       |
| KTO4G721B | CMC  | 3.1       | KTO4G54H1 | SMC  | 1.5       | KTO4G711B | CMC  | 1.6       |
| KTO4G721C | CMC  | 2.2       | KTO4G52I1 | SMC  | 1.7       | KTO4G711C | CMC  | 1.2       |
| KTO4G721D | CMC  | 3.1       | KTO4G35D1 | SMC  | 1.3       | KTO4G711D | CMC  | 1.7       |
| KTO4G46E1 | SMC  | 1.0       | KTO4G561A | CMC  | 3.3       |           |      |           |

## 12.5. Review of psychometric item properties

Psychometric item properties for all assessment items were analysed using the following criteria (using senate):

- the overall facility of items, measured by the percentage of correct responses (weighted in the case of CMC items)
- the item-rest correlation, which reflects the correlation of a scored item with the total score based on all other items in a booklet
- the weighted mean square (MNSQ) statistic (Wright and Masters, 1982<sup>[3]</sup>), which indicates the level of item fit for the IRT scaling model and tends to be satisfactory when using a 2PL model
- the (initial) estimate of the scaled 2PL location parameter (computed by dividing the location parameter by the slope parameter)
- the 2PL slope parameter, which indicates the discrimination of each item (with low values denoting low discrimination and high values higher discrimination).

The results for the international sample (Table 12.4) highlighted good psychometric properties for most items, except for three items that were flagged for further review: KTF4G33D1, KTF4G45T1 and KTF4G641. Statistics for these items revealed low discrimination as indicated by very low item-rest correlations (below 0.15) and corresponding low 2PL slope parameters (below 0.35). Item statistics were further reviewed based on separate calibrations for each national sample, which showed similarly low discrimination for these items across all countries. Based on this extensive review, the decision was taken to remove these three items from the final scaling of GPK.

**Table 12.4. Item facilities, item-rest correlations, weighted item fit and initial parameter estimations for the full set of GPK items**

| Item name | Item type | Facility<br>(% correct) | Item-rest<br>correlation | Weighted<br>MNSQ | Scaled 2PL<br>location parameter | 2PL slope<br>parameter |
|-----------|-----------|-------------------------|--------------------------|------------------|----------------------------------|------------------------|
| KTF4G28A1 | SMC       | 56                      | 0.28                     | 1.00             | -0.37                            | 0.65                   |
| KTF4G29T1 | SMC       | 60                      | 0.34                     | 1.00             | -0.59                            | 0.82                   |
| KTF4G301  | CMC       | 50                      | 0.49                     | 0.99             | 0.04                             | 0.79                   |
| KTF4G31C1 | SMC       | 53                      | 0.45                     | 0.99             | -0.15                            | 1.19                   |
| KTF4G32F1 | SMC       | 72                      | 0.49                     | 1.00             | -0.89                            | 1.55                   |
| KTF4G33D1 | SMC       | 48                      | 0.12                     | 1.00             | 0.31                             | 0.27                   |
| KTF4G34H1 | SMC       | 67                      | 0.37                     | 1.00             | -0.87                            | 0.97                   |
| KTF4G35D1 | SMC       | 55                      | 0.35                     | 1.00             | -0.28                            | 0.85                   |
| KTF4G36A1 | SMC       | 60                      | 0.29                     | 1.00             | -0.64                            | 0.70                   |
| KTF4G371  | CMC       | 55                      | 0.51                     | 1.00             | -0.22                            | 0.85                   |
| KTF4G381  | CMC       | 43                      | 0.63                     | 0.99             | 0.25                             | 1.39                   |
| KTF4G39A1 | SMC       | 54                      | 0.35                     | 1.00             | -0.23                            | 0.82                   |
| KTF4G401  | CMC       | 36                      | 0.46                     | 0.99             | 0.58                             | 1.33                   |
| KTF4G41T1 | SMC       | 51                      | 0.44                     | 0.99             | -0.03                            | 1.13                   |
| KTF4G42T1 | SMC       | 43                      | 0.42                     | 0.99             | 0.34                             | 1.11                   |
| KTF4G43E1 | SMC       | 48                      | 0.29                     | 1.00             | 0.13                             | 0.67                   |
| KTF4G44U1 | SMC       | 55                      | 0.36                     | 1.00             | -0.26                            | 0.89                   |
| KTF4G45T1 | SMC       | 28                      | 0.12                     | 1.00             | 3.21                             | 0.31                   |
| KTF4G46E1 | SMC       | 45                      | 0.35                     | 1.00             | 0.27                             | 0.83                   |
| KTF4G47E1 | SMC       | 70                      | 0.40                     | 1.00             | -0.94                            | 1.09                   |
| KTF4G48P1 | SMC       | 60                      | 0.48                     | 1.00             | -0.39                            | 1.34                   |
| KTF4G49E1 | SMC       | 56                      | 0.36                     | 1.00             | -0.30                            | 0.88                   |
| KTF4G50S1 | SMC       | 59                      | 0.41                     | 0.99             | -0.44                            | 1.03                   |
| KTF4G51S1 | SMC       | 36                      | 0.33                     | 0.99             | 0.80                             | 0.83                   |
| KTF4G52I1 | SMC       | 44                      | 0.28                     | 1.00             | 0.43                             | 0.65                   |
| KTF4G53G1 | SMC       | 64                      | 0.37                     | 1.00             | -0.75                            | 0.96                   |
| KTF4G54H1 | SMC       | 35                      | 0.19                     | 1.00             | 1.48                             | 0.45                   |
| KTF4G55F1 | SMC       | 78                      | 0.39                     | 0.99             | -1.34                            | 1.18                   |
| KTF4G561  | CMC       | 42                      | 0.34                     | 1.00             | 0.56                             | 0.52                   |
| KTF4G57R1 | SMC       | 51                      | 0.32                     | 1.00             | -0.06                            | 0.77                   |
| KTF4G581  | CMC       | 32                      | 0.37                     | 1.01             | 0.97                             | 0.97                   |
| KTF4G591  | CMC       | 60                      | 0.60                     | 0.99             | -0.42                            | 1.29                   |
| KTF4G601  | CMC       | 69                      | 0.40                     | 1.00             | -1.07                            | 0.68                   |
| KTF4G61A1 | SMC       | 84                      | 0.32                     | 0.99             | -1.90                            | 1.06                   |
| KTF4G621  | CMC       | 46                      | 0.55                     | 1.00             | 0.17                             | 1.08                   |
| KTF4G631  | CMC       | 23                      | 0.49                     | 0.99             | 1.19                             | 1.09                   |
| KTF4G641  | CMC       | 29                      | 0.09                     | 1.00             | 4.24                             | 0.21                   |
| KTF4G651  | CMC       | 33                      | 0.48                     | 1.01             | 0.91                             | 0.99                   |
| KTF4G66R1 | SMC       | 59                      | 0.36                     | 1.00             | -0.48                            | 0.88                   |
| KTF4G67S1 | SMC       | 61                      | 0.51                     | 1.00             | -0.45                            | 1.49                   |



| Item name | Item type | Facility<br>(% correct) | Item-rest<br>correlation | Weighted<br>MNSQ | Scaled 2PL<br>location parameter | 2PL slope<br>parameter |
|-----------|-----------|-------------------------|--------------------------|------------------|----------------------------------|------------------------|
| KTF4G681  | CMC       | 36                      | 0.30                     | 1.00             | 1.03                             | 0.45                   |
| KTF4G69D1 | SMC       | 74                      | 0.49                     | 1.00             | -0.94                            | 1.59                   |
| KTF4G70E1 | SMC       | 58                      | 0.35                     | 1.00             | -0.44                            | 0.84                   |
| KTF4G711  | CMC       | 51                      | 0.48                     | 1.00             | -0.03                            | 0.80                   |
| KTF4G721  | CMC       | 40                      | 0.52                     | 1.00             | 0.44                             | 1.02                   |
| KTF4G73L1 | SMC       | 67                      | 0.50                     | 0.99             | -0.66                            | 1.54                   |
| KTF4G741  | CMC       | 32                      | 0.41                     | 1.00             | 1.00                             | 0.69                   |
| KTF4G751  | CMC       | 30                      | 0.33                     | 1.00             | 1.13                             | 0.88                   |
| KTF4G761  | CMC       | 65                      | 0.34                     | 1.00             | -1.06                            | 0.58                   |
| KTF4G77O1 | SMC       | 75                      | 0.42                     | 1.00             | -1.12                            | 1.28                   |
| KTF4G78Q1 | SMC       | 61                      | 0.42                     | 1.00             | -0.49                            | 1.11                   |
| KTF4G79C1 | SMC       | 38                      | 0.27                     | 1.00             | 0.80                             | 0.65                   |

## 12.6. Review of item dimensionality

The TALIS TKS framework (OECD, 2025<sup>[4]</sup>) stipulates that teachers' GPK broadly encompasses three content-related dimensions:

- **instruction:** teaching methods and lesson planning vs. classroom management
- **learning:** learning and development vs. affective-motivational dispositions
- **assessment:** evaluation and diagnostic procedures vs. data literacy, interpretation and use.

The TKS framework also identifies three cross-cutting categories of types of knowledge:

- **cognitive demand:** recall vs. analyse or apply
- **knowledge base:** theoretical/scientific vs. practice-based
- **thematic orientation:** core knowledge vs. emergent priorities.

GPK items were developed to ensure coverage of these aspects and can be classified according to these framework dimensions.

Multi-dimensional IRT models were used to investigate the possibility of separately reporting assessment results for these different sub-dimensions.

Two two-dimensional models were estimated using data from the pooled international sample only. One model distinguished items according to their **cognitive demand** (recall vs. analyse and apply). The second model distinguished items according to their **knowledge base** (theoretical/scientific vs. practice-based). The correlations between the two latent knowledge-type dimensions turned out to be very high in both models (0.99), which suggested that it would not be meaningful to report sub-scales reflecting these different types of knowledge.

Then, a three-dimensional model was estimated, distinguishing the three (broader) content-related dimensions of instruction, learning and assessment. The model was estimated for the international sample as well as separately for each national sample (Table 12.5). The results showed that the correlations between these three dimensions were very high (0.97-0.98). While they were somewhat lower in some of the national samples, they were mostly above 0.90, suggesting that only minor differences exist in the variation of GPK across these sub-dimensions. As there were only minor differences in the distribution of estimated sub-scale scores and the overall score across countries, it was decided to derive and report only an overall scale reflecting GPK.

**Table 12.5. Correlations between latent dimensions of teachers' GPK**

| Sample               | Latent correlations between subdimensions |                          |                           |
|----------------------|-------------------------------------------|--------------------------|---------------------------|
|                      | Assessment with instruction               | Assessment with learning | Instruction with learning |
| Chile                | 0.95                                      | 0.93                     | 0.94                      |
| Croatia              | 0.94                                      | 0.92                     | 0.96                      |
| Morocco              | 0.94                                      | 0.91                     | 0.93                      |
| Poland               | 0.93                                      | 0.87                     | 0.92                      |
| Portugal             | 0.94                                      | 0.94                     | 0.95                      |
| Saudi Arabia         | 0.93                                      | 0.90                     | 0.92                      |
| South Africa         | 0.95                                      | 0.95                     | 0.95                      |
| United States        | 0.96                                      | 0.95                     | 0.97                      |
| International sample | 0.98                                      | 0.97                     | 0.98                      |

## 12.7. Review of differential item functioning by country

Comparability of data and results from cross-national large-scale assessments relies on assessment items having comparable properties across participating countries. An assessment item shows *item-by-country interaction* (country DIF) when respondents with the same levels of knowledge, but from different countries, display a different probability of correctly answering the item. It is important to carefully examine items that show considerable lack of measurement invariance across countries. These variations may indicate problems in the translation or national adaptation of the items (for example, by including content that is not appropriate to specific national contexts). Translation or adaptation mistakes are typical examples of factors that make an item more or less difficult for reasons unrelated to the construct the assessment aims to measure.

To assess the occurrence of item-by-country interactions, nationally calibrated item parameters were compared with those from a calibration of item parameters based on the combined dataset from all eight participating countries. Confidence intervals for each national item difficulty parameter were computed based on the respective standard errors and adjustments to account for possible design effects as well as for multiple comparisons.

Figure 12.2 illustrates item-by-country interaction using the example of item KTF4G54H1 (Behaviourism), which was one of the items showing a considerable amount of variation across participating countries. Figure 12.3 shows the example of item KTF4G301 (intrinsic and extrinsic motivation) for which only minor variation in item location across national samples was observed.

Based on these comparisons, correlations were also computed between item location and slope parameters from the calibration of the international sample with those from national samples, to provide information on the general alignment of national and international item parameters. These correlations were calculated in two different ways: (1) unadjusted correlations, defined as those between national item parameters and those from the international sample including all countries; and (2) adjusted correlations, defined as those between national item parameters and those from a combined sample that included only data from the other seven countries.

Figure 12.2. Example of graph for review of item-by-country interaction (KTF4G54H1)

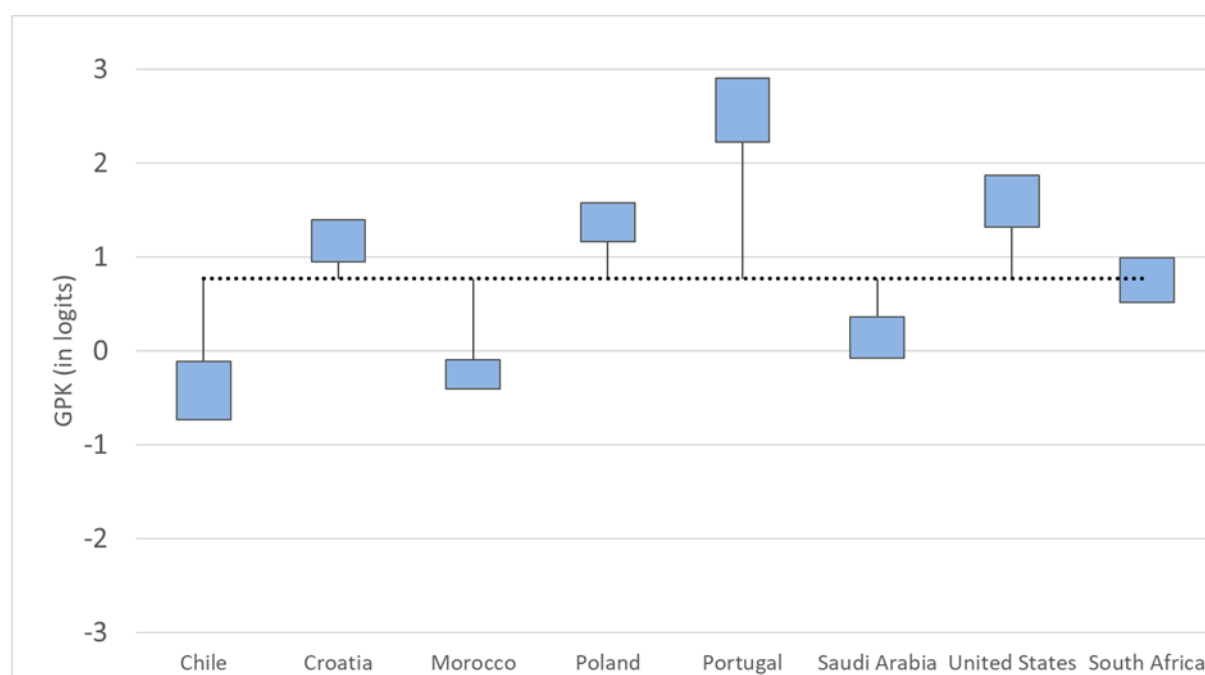


Figure 12.3. Example of graph for review of item-by-country interaction (KTF4G301)

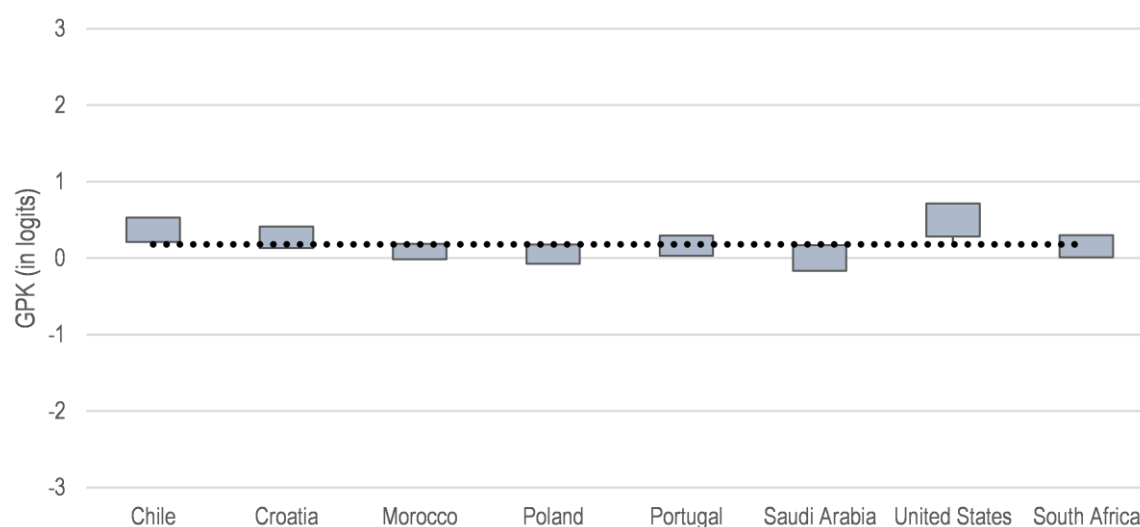


Table 12.6 shows consistently high unadjusted correlations between international and national item location parameters (0.84 on average), with correlations below 0.80 for Morocco and Saudi Arabia only. The unadjusted correlations between national and international slope parameters were generally lower (0.60 on average), with the lowest correlations recorded for Morocco and Saudi Arabia (below 0.50). In both cases, the adjusted correlations were, as expected, somewhat lower than the adjusted one (on average 0.79 for the item location and 0.55 for the slope parameters).

**Table 12.6. Correlations between national and international item parameters**

| Country       | Item location parameters |          | Item slope parameters |          |
|---------------|--------------------------|----------|-----------------------|----------|
|               | Unadjusted               | Adjusted | Unadjusted            | Adjusted |
| Chile         | 0.85                     | 0.80     | 0.55                  | 0.49     |
| Croatia       | 0.84                     | 0.78     | 0.72                  | 0.64     |
| Morocco       | 0.76                     | 0.69     | 0.47                  | 0.48     |
| Poland        | 0.86                     | 0.80     | 0.59                  | 0.51     |
| Portugal      | 0.90                     | 0.86     | 0.61                  | 0.56     |
| Saudi Arabia  | 0.77                     | 0.71     | 0.45                  | 0.42     |
| South Africa  | 0.88                     | 0.85     | 0.74                  | 0.68     |
| United States | 0.84                     | 0.80     | 0.69                  | 0.59     |
| Average       | 0.84                     | 0.79     | 0.60                  | 0.55     |

### 12.7.1. National item adjudication

National project managers (NPMs) received detailed national reports that included information about the psychometric quality of their GPK assessment items in comparison with results for the international sample. NPMs were also provided with a list of items that were flagged for concerns about their psychometric quality (such as low discrimination, or larger deviations in facility from the international sample results) and asked to review regarding possible context effects or adaptation/translation issues that might explain these anomalies.

In particular, based on results from national and international calibrations of GPK items, NPMs were provided with the following information:

- individual item statistics, that showed for each assessment item the (national) distribution of responses, item-rest correlations, IRT 2PL parameters, weighted item fit and average estimated GPK scores in each response category
- summary national statistic tables that listed for all assessment items the overall number of respondents, facility (percentage of correct responses), item-rest correlation, item-total correlation (i.e. scored item correlation with sum score based on all items in a booklet), weighted item fit and item location coefficient
- a list of national items that were flagged for one of the following reasons:
  - SMC items flagged if a distractor had a positive point-biserial correlation
  - CMC items flagged if they exhibited unexpected category ordering
  - items flagged for item-by-country interaction if an item was found to be relatively easier or harder (i.e. if there was a difference of one logit or more between the national and the overall item location parameters) in a country compared to the overall estimate (based on the international TKS sample).

The comparisons of psychometric properties (such as facility or discrimination) of items at the national level (considering issues with psychometric quality only occurring in individual national samples), in combination with feedback from countries, led to the identification of five items (two in Chile and three in Poland) whose translations deviated from the original English source version. These items were discarded from the scaling for those countries and were set to “Not administered” in the TALIS database. Preliminary calibrations further showed that one item in Saudi Arabia (KTF4G46E1) had a negative 2PL slope parameter (indicating that respondents correctly answering that item had lower GPK scores, on average, than respondents who provided the wrong answer). This item was discarded at the national level from the international calibration and the national scaling but was preserved in the TALIS database.

Table 12.7. Example of flagged items report

| Item no. | Item identifier | Item name                           | Response format | Facility (% correct) | Item-rest correlation | Item-rest correlation (< 0.2) | Distractor with positive biserial correlations (SMC items) | Item category disordering (CMC items) | Item difficulty compared to overall estimate | Flagged for checking |
|----------|-----------------|-------------------------------------|-----------------|----------------------|-----------------------|-------------------------------|------------------------------------------------------------|---------------------------------------|----------------------------------------------|----------------------|
| 3        | KTF4G32F1       | Achievement-related feedback        | SMC             | 31                   | 0.14                  | Yes                           |                                                            |                                       | Harder                                       | Yes                  |
| 33       | KTF4G45T1       | Metacognition and creative thinking | SMC             | 27                   | 0.05                  | Yes                           | Yes                                                        |                                       |                                              | Yes                  |
| 42       | KTF4G51S1       | Summative assessment                | SMC             | 33                   | 0.18                  | Yes                           |                                                            |                                       |                                              | Yes                  |
| 45       | KTF4G641        | Standardised tests                  | CMC             | 26                   | 0.06                  | Yes                           |                                                            | Yes                                   |                                              | Yes                  |
| 48       | KTF4G6751       | Think aloud strategy                | SMC             | 86                   | 0.48                  |                               |                                                            |                                       | Easier                                       | Yes                  |
| 52       | KTF4G33D1       | Zone of proximal development        | SMC             | 39                   | 0.06                  | Yes                           | Yes                                                        |                                       |                                              | Yes                  |

Subsequently, item fit was further reviewed to identify items with larger country DIF warranting treatment as (separate) national items in the final scaling with their corresponding national item parameters. To this end, the 49 adjudicated items were included in an international calibration. Item fit was then reviewed at the national level based on the following fit statistics, in combination with visual inspections of expected and observed item characteristic curves for each national sample:

- the mean deviation (MD) statistic
- the root mean square deviation (RMSD) statistic
- the standardised chi square (S-X2) statistic
- the weighted mean square (Infit) statistic.

All four fit statistics were calculated based on comparisons between the expected and observed probabilities of correct responses to each assessment item.

In particular, the MD and RMSD statistics are calculated as follows (Robitzsch, 2022<sup>[5]</sup>; Yamamoto, Khorramdel and von Davier, 2013<sup>[6]</sup>):

$$MD_g = \int [p_g^{obs}(\theta) - p_g^{exp}(\theta)] f_g(\theta) d\theta$$

$$RMSD_g = \sqrt{\int [p_g^{obs}(\theta) - p_g^{exp}(\theta)]^2 f_g(\theta) d\theta}$$

Letting  $g = 1, \dots, G$  denote the education systems participating in the TKS,  $p_g^{obs}(\theta)$  and  $p_g^{exp}(\theta)$  are the observed and expected probability of a correct response to each item given proficiency  $\theta$ , while  $f_g(\theta)$  is the group-specific density of teachers' GPK scale. For assessing item fit, only the RMSD value was used to flag item misfit at a threshold of 0.2, above which items were flagged for national item misfit. A similar flag for MD values (flagging statistics outside the range of -0.2 and 0.2) was used as an auxiliary index that indicated whether an item was relatively harder or easier than for the combined sample.

The S-X2 statistic is calculated as:

$$S - X_g^2 = \sum_{k=1}^{n-1} \frac{(O_{kg} - E_{kg})^2}{(1 - E_{kg})}$$

Letting  $g = 1, \dots, G$  denote the education systems participating in the TKS and  $k = 1, \dots, n - 1$  all possible score groups,  $O_{ikg}$  are the observed and  $E_{ikg}$  the expected item responses (Orlando and Thissen, 2000<sup>[7]</sup>). For the assessment of item misfit at the national level, a threshold value of 15 was used, above which items were flagged for national item misfit.

The Infit statistic (Wright and Masters, 1982<sup>[3]</sup>) was calculated as:

$$Infit_{gn} = \frac{\sum_n z_{ng}^2 Var(X_{ng})}{\sum_n Var(X_{ng})}$$

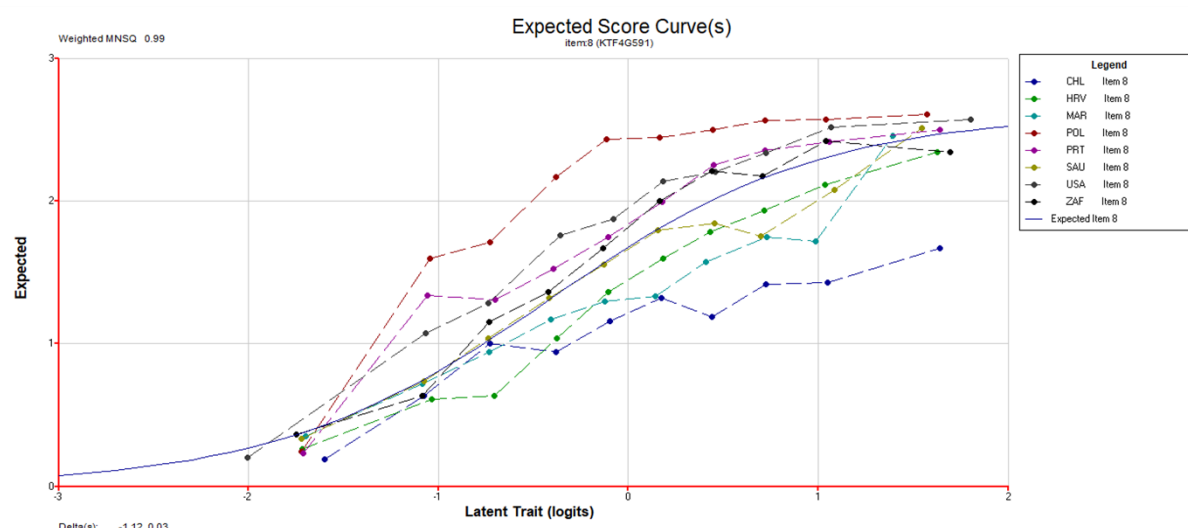
For each item, letting  $g = 1, \dots, G$  denote the education systems participating in the TKS,  $n$  is the number respondents in each country,  $Var(X_{ng})$  is the variance of the observed responses  $X_{ng}$  and  $z_{ng}^2$  are the residuals, which, with  $E(X_{ng})$  denoting the expected responses, are calculated as:

$$z_{ng}^2 = \frac{X_{ng} - E(X_{ng})}{\sqrt{Var(X_{ng})}}$$

Infit values close to 1 indicate a good fit to the scaling model, while values below 1 indicate higher-than-expected and those above 1 lower-than-expected discrimination. To assess national item misfit, 0.7 and 1.3 were used as the lower and higher thresholds, flagging items with statistics outside of this range.

Following the initial calibration with all items, two further calibrations were performed to derive the final item parameters for the scaling of GPK items. After discarding three items (KTF4G33D1, KTF4G45T1 and KTF4G641) from the item set and those national items that had translation deviations or negative discrimination, the remaining 49 items were calibrated, and the residual-based fit statistics were calculated within each participating education system. These statistics were reviewed in reference to visual plots of the expected and the observed item curves within each country (see example in Figure 12.4).

**Figure 12.4. Example item plot for identifying item misfit at the national level**



Item KTF4G591 was flagged in Poland ( $S-X_2 = 22.6$ ,  $RMSD = 0.216$ ) and the MD (0.196) indicating that the item was easier in this country. The same item was also flagged for Chile ( $S-X_2 = 28.1$ ,  $RMSD = 0.226$ ) with an MD (-0.206) indicating that the item was much harder. This finding is visible in Figure 12.4 where the brown dotted line (for Poland) is considerably above the expected (straight) line, while the blue dotted

line (for Chile) is clearly below it. In cases like this, the corresponding item was discarded from scaling at the international level but was treated as a national item with its own item parameters in the subsequent calibration.

After the first calibration, 11 national items were identified as presenting lack of item fit and treated as national items with country-specific parameters. The second calibration showed no further instances of item misfit at the national level and was used as the final calibration for the scaling of GPK items.

Table 12.8 shows a list of items that were either: (i) excluded for all countries from scaling; (ii) excluded from national scaling and the national database due to translation deviations; (iii) excluded from national scaling due to negative discrimination parameters; or (iv) treated as national items for scaling due to lack of measurement invariance.

**Table 12.8. List of items that were excluded or treated as national items**

| Item      | Level         | Treatment                                    | Rationale                                           |
|-----------|---------------|----------------------------------------------|-----------------------------------------------------|
| KTF4G45T1 | International | Discarded from scaling for all countries     | Poor psychometric item quality                      |
| KTF4G641  |               |                                              |                                                     |
| KTF4G33D1 |               |                                              |                                                     |
| KTF4G36A1 | Poland        | Discarded from national database and scaling | Translation error reported by national centre       |
| KTF4G721  | Chile         |                                              |                                                     |
| KTF4G70E1 | Poland        |                                              |                                                     |
| KTF4G51S1 |               |                                              |                                                     |
| KTF4G69D1 | Chile         |                                              |                                                     |
| KTF4G46E1 | Saudi Arabia  | Discarded from national scaling              | Negative slope parameter in preliminary calibration |
| KTF4G54H1 | Chile         | Treated as national item for scaling         | Country DIF (national item fit issues)              |
| KTF4G591  |               |                                              |                                                     |
| KTF4G50S1 |               |                                              |                                                     |
| KTF4G49E1 |               |                                              |                                                     |
| KTF4G78Q1 | Croatia       |                                              |                                                     |
| KTF4G55F1 | Morocco       |                                              |                                                     |
| KTF4G591  | Poland        |                                              |                                                     |
| KTF4G54H1 | Portugal      |                                              |                                                     |
| KTF4G29T1 |               |                                              |                                                     |
| KTF4G32F1 | Saudi Arabia  |                                              |                                                     |
| KTF4G42T1 | United States |                                              |                                                     |

Table 12.9 shows the final item parameters for the scaling of GPK items. While the first 49 items were based on data from all or most countries, the last 11 items were those that were treated as national items. To clearly indicate this, the names of such items have been modified, with the ISO three-letter codes replacing the first three letters of the item name. The final as well as previous calibrations were conducted with senate weights.

**Table 12.9. Final item parameters for the scaling of GPK items**

| Item no. | Item identifier | Item parameters |          |        |        |
|----------|-----------------|-----------------|----------|--------|--------|
|          |                 | Slope           | Location | Step 1 | Step 2 |
| 1        | KTF4G69D1       | 1.56            | -1.36    |        |        |

| Item no. | Item identifier | Item parameters |          |        |        |
|----------|-----------------|-----------------|----------|--------|--------|
|          |                 | Slope           | Location | Step 1 | Step 2 |
| 2        | KTF4G79C1       | 0.65            | 0.52     |        |        |
| 3        | KTF4G32F1       | 1.46            | -1.55    |        |        |
| 4        | KTF4G31C1       | 1.18            | -0.18    |        |        |
| 5        | KTF4G47E1       | 1.09            | -1.02    |        |        |
| 6        | KTF4G34H1       | 0.98            | -0.84    |        |        |
| 7        | KTF4G54H1       | 0.45            | 0.71     |        |        |
| 8        | KTF4G591        | 1.38            | -0.56    | -0.50  | 0.50   |
| 9        | KTF4G43E1       | 0.67            | 0.08     |        |        |
| 10       | KTF4G46E1       | 0.85            | 0.20     |        |        |
| 11       | KTF4G751        | 0.88            | 0.99     |        |        |
| 12       | KTF4G401        | 1.33            | 0.78     |        |        |
| 13       | KTF4G50S1       | 0.98            | -0.29    |        |        |
| 14       | KTF4G681        | 0.45            | 0.46     | 0.17   | -0.17  |
| 15       | KTF4G711        | 0.79            | -0.02    | -0.27  | 0.27   |
| 16       | KTF4G49E1       | 0.85            | -0.12    |        |        |
| 17       | KTF4G44U1       | 0.89            | -0.23    |        |        |
| 18       | KTF4G70E1       | 1.03            | -0.61    |        |        |
| 19       | KTF4G601        | 0.68            | -0.74    | -0.25  | 0.25   |
| 20       | KTF4G561        | 0.53            | 0.29     | -0.17  | 0.17   |
| 21       | KTF4G78Q1       | 1.30            | -0.76    |        |        |
| 22       | KTF4G36A1       | 0.74            | -0.50    |        |        |
| 23       | KTF4G301        | 0.78            | 0.03     | 0.17   | -0.17  |
| 24       | KTF4G53G1       | 0.97            | -0.72    |        |        |
| 25       | KTF4G52I1       | 0.65            | 0.28     |        |        |
| 26       | KTF4G35D1       | 0.85            | -0.24    |        |        |
| 27       | KTF4G61A1       | 1.06            | -2.01    |        |        |
| 28       | KTF4G73L1       | 1.54            | -1.01    |        |        |
| 29       | KTF4G29T1       | 0.99            | -0.66    |        |        |
| 30       | KTF4G66R1       | 0.89            | -0.42    |        |        |
| 31       | KTF4G55F1       | 1.05            | -1.79    |        |        |
| 32       | KTF4G77O1       | 1.28            | -1.43    |        |        |
| 33       | KTF4G42T1       | 0.92            | 0.51     |        |        |
| 34       | KTF4G28A1       | 0.65            | -0.24    |        |        |
| 35       | KTF4G41T1       | 1.13            | -0.03    |        |        |
| 36       | KTF4G761        | 0.58            | -0.61    | -0.58  | 0.58   |
| 37       | KTF4G651        | 0.98            | 0.90     | -0.79  | 0.79   |
| 38       | KTF4G721        | 1.09            | 0.34     | -0.52  | 0.52   |
| 39       | KTF4G581        | 0.98            | 0.94     |        |        |
| 40       | KTF4G631        | 1.09            | 1.30     | -0.15  | 0.15   |
| 41       | KTF4G51S1       | 0.90            | 0.56     |        |        |
| 42       | KTF4G371        | 0.85            | -0.19    | 0.14   | -0.14  |
| 43       | KTF4G39A1       | 0.82            | -0.18    |        |        |



| Item no. | Item identifier | Item parameters |          |        |        |
|----------|-----------------|-----------------|----------|--------|--------|
|          |                 | Slope           | Location | Step 1 | Step 2 |
| 44       | KTF4G741        | 0.69            | 0.69     | 0.01   | -0.01  |
| 45       | KTF4G48P1       | 1.32            | -0.52    |        |        |
| 46       | KTF4G67S1       | 1.49            | -0.67    |        |        |
| 47       | KTF4G381        | 1.41            | 0.35     | -0.38  | 0.38   |
| 48       | KTF4G621        | 1.07            | 0.19     | -0.52  | 0.52   |
| 49       | KTF4G57R1       | 0.77            | -0.04    |        |        |
| 50       | SAU4G32F1       | 0.57            | 0.32     |        |        |
| 51       | CHL4G54H1       | 1.29            | -0.43    |        |        |
| 52       | PRT4G54H1       | 1.43            | 2.64     |        |        |
| 53       | CHLTF4G59       | 1.55            | 0.83     | -2.40  | 2.40   |
| 54       | POLTF4G59       | 1.42            | -1.77    | 0.47   | -0.47  |
| 55       | CHL4G50S1       | 1.78            | -1.95    |        |        |
| 56       | CHL4G49E1       | 0.76            | -1.33    |        |        |
| 57       | HRV4G78Q1       | 0.93            | 0.40     |        |        |
| 58       | PRT4G29T1       | 0.55            | 0.24     |        |        |
| 59       | MAR4G55F1       | 0.50            | 0.00     |        |        |
| 60       | USA4G42T1       | 1.80            | -0.85    |        |        |

### 12.7.2. Differential item functioning by gender

The analyses of GPK assessment data included an exploration of potential DIF by gender. DIF occurs when groups of respondents with the same degree of knowledge have different probabilities of responding correctly to an item. The IRT model assumes the probability only to be a function of the measured latent variable and not of any group membership. Groups are most typically defined in terms of nationality in DIF analyses but can also be defined according to any other characteristic. So, if men have a higher probability of correctly answering an item than women (at the same level of overall GPK), the item shows gender DIF. Gender DIF was assessed for the international sample using senate weights.

Estimates of gender DIF were derived by including interaction terms in the item response model. The following facet model was used to investigate the occurrence of gender DIF for dichotomously scored test items:

$$P_i(\theta_n) = \frac{\exp(\theta_n - (\alpha_i(\delta_i - \eta_g + \lambda_{ig})))}{1 + \exp(\theta_n - (\alpha_i(\delta_i - \eta_g + \lambda_{ig})))}$$

Where  $\theta_n$  denotes the ability of person  $n$ ,  $\delta_i$  the location of item  $i$ , and  $\alpha_i$  is the discrimination (slope) parameter. To measure parameter equivalence across the two gender groups, two extra terms were included in the scaling model. The additional parameter for gender effects is denoted by  $\lambda_{ig}$ . To obtain proper estimates, we also needed to include the overall gender effect  $\eta_g$  in the model. Both item-by-gender interaction estimates  $\lambda_{ig}$  and overall gender effects  $\eta_g$  were constrained to sum to 0.

For CMC items with more than two categories, this was modelled as:

$$P_{x_i}(\theta_n) = \frac{\exp \sum_{k=0}^{x_i} (\theta_n - (\alpha_i(\delta_i - \eta_g + \lambda_{ig} + \tau_{ik})))}{\sum_{h=0}^{m_i} \exp \sum_{k=0}^h (\theta_n - (\alpha_i(\delta_i - \eta_g + \lambda_{ig} + \tau_{ik})))} \quad x_i = 1, 2, \dots, m_i$$

The difference in item difficulty between gender groups was estimated by multiplying the item-by-gender interaction estimates by two to obtain the estimated difference between the two comparison groups and was reviewed for each item (Table 12.10). While some six items had notable DIF in favour of females and

one in favour of males, most items in this assessment showed no notable item DIF. Based on international data that were included in the final calibration, the estimated differences in ability between gender groups was larger than 0.3 logits (which was used as a threshold, and which is equivalent to somewhat less than a third of a standard deviation) for 7 items (out of 49).

**Table 12.10. Gender DIF estimates for GPK assessment items**

| Item no. | Item name | DIF (female) | Easier for | Difference larger than 0.3 logits |
|----------|-----------|--------------|------------|-----------------------------------|
| 1        | KTF4G69D1 | -0.70        | Females    | Yes                               |
| 2        | KTF4G79C1 | 0.20         | Males      | No                                |
| 3        | KTF4G32F1 | -0.48        | Females    | Yes                               |
| 4        | KTF4G31C1 | -0.19        | Females    | No                                |
| 5        | KTF4G47E1 | -0.04        | Females    | No                                |
| 6        | KTF4G34H1 | -0.25        | Females    | No                                |
| 7        | KTF4G54H1 | 0.49         | Males      | Yes                               |
| 8        | KTF4G591  | -0.35        | Females    | Yes                               |
| 9        | KTF4G43E1 | 0.26         | Males      | No                                |
| 10       | KTF4G46E1 | 0.17         | Males      | No                                |
| 11       | KTF4G751  | 0.07         | Males      | No                                |
| 12       | KTF4G401  | -0.05        | Females    | No                                |
| 13       | KTF4G50S1 | 0.11         | Males      | No                                |
| 14       | KTF4G681  | 0.26         | Males      | No                                |
| 15       | KTF4G711  | -0.09        | Females    | No                                |
| 16       | KTF4G49E1 | 0.15         | Males      | No                                |
| 17       | KTF4G44U1 | 0.00         | Males      | No                                |
| 18       | KTF4G70E1 | -0.07        | Females    | No                                |
| 19       | KTF4G601  | 0.19         | Males      | No                                |
| 20       | KTF4G561  | 0.10         | Males      | No                                |
| 21       | KTF4G78Q1 | -0.01        | Females    | No                                |
| 22       | KTF4G36A1 | 0.03         | Males      | No                                |
| 23       | KTF4G301  | 0.07         | Males      | No                                |
| 24       | KTF4G53G1 | 0.06         | Males      | No                                |
| 25       | KTF4G52I1 | 0.01         | Males      | No                                |
| 26       | KTF4G35D1 | 0.19         | Males      | No                                |
| 27       | KTF4G61A1 | -0.22        | Females    | No                                |
| 28       | KTF4G73L1 | -0.63        | Females    | Yes                               |
| 29       | KTF4G29T1 | 0.10         | Males      | No                                |
| 30       | KTF4G66R1 | 0.20         | Males      | No                                |
| 31       | KTF4G55F1 | -0.35        | Females    | Yes                               |
| 32       | KTF4G77O1 | -0.01        | Females    | No                                |
| 33       | KTF4G42T1 | 0.02         | Males      | No                                |
| 34       | KTF4G28A1 | 0.10         | Males      | No                                |
| 35       | KTF4G41T1 | -0.05        | Females    | No                                |

| Item no. | Item name | DIF (female) | Easier for | Difference larger than 0.3 logits |
|----------|-----------|--------------|------------|-----------------------------------|
| 36       | KTF4G761  | 0.02         | Males      | No                                |
| 37       | KTF4G651  | 0.16         | Males      | No                                |
| 38       | KTF4G721  | 0.13         | Males      | No                                |
| 39       | KTF4G581  | -0.23        | Females    | No                                |
| 40       | KTF4G631  | 0.01         | Males      | No                                |
| 41       | KTF4G51S1 | 0.13         | Males      | No                                |
| 42       | KTF4G371  | 0.05         | Males      | No                                |
| 43       | KTF4G39A1 | -0.03        | Females    | No                                |
| 44       | KTF4G741  | 0.07         | Males      | No                                |
| 45       | KTF4G48P1 | -0.17        | Females    | No                                |
| 46       | KTF4G67S1 | -0.42        | Females    | Yes                               |
| 47       | KTF4G381  | -0.25        | Females    | No                                |
| 48       | KTF4G621  | -0.10        | Females    | No                                |
| 49       | KTF4G57R1 | 0.18         | Males      | No                                |

## 12.8. Scaling of GPK items

For the final scaling of GPK, the Generalized Partial Credit Model was used, and plausible values were computed as final GPK scale scores (Mislevy, 1991<sup>[8]</sup>; Mislevy and Sheehan, 1987<sup>[9]</sup>; von Davier, Gonzalez and Mislevy, 2009<sup>[10]</sup>; von Davier, Gonzalez and Schulz, 2020<sup>[11]</sup>). Plausible values were derived using the ACER ConQuest software, which allows conditioning on all available background information (from the teacher questionnaire) as well as on between-school differences.

Using item parameters anchored at their estimated values from the calibration based on the international TKS data, plausible values were generated as random draws  $\hat{\theta}_{ng}$  from the following (posterior) distribution:

$$\hat{\theta}_{ng} \sim N \left( E_g(\theta|x_n; z_n), \sqrt{V_g(\theta|x_n; z_n)} \right)$$

that depend on response data  $x_n$  (the conditional item response model), other available context data  $z_n$  (conditioning variables) and group membership  $g$ , which in the case of TALIS TKS 2024 was determined by the education system in which an individual was assessed. Here,  $E_g(\theta|x_n; z_n)$  represents the posterior distribution, while  $V_g(\theta|x_n; z_n)$  denotes the posterior variance, which provides a measure of uncertainty – see more detailed descriptions in Adams, Wu and Macaskill (1997<sup>[12]</sup>), Adams (2002<sup>[13]</sup>) and von Davier, Gonzalez and Schulz (2020<sup>[11]</sup>). Group membership  $g$  is accounted for by drawing plausible values separately for each national sample.

In a first step, GPK items were calibrated with a sample consisting of data from all eight countries participating in the TALIS TKS, using senate weights (see information on item calibration procedures above). In a second step, the item parameters obtained from this calibration were anchored for the subsequent generation of plausible values, that was conducted separately for each national datafile. For each teacher, five plausible values were drawn, that provide a robust basis for computing the measurement error as part of the final reported standard error for all statistics based on TKS GPK data.

The conditioning part of the model included some direct regressors (number of not-reached responses, average GPK of all other teachers at the school, explicit stratum, teachers' gender) as well as factor scores derived from a principal component analysis (PCA) of all other information available in the TKS

questionnaire. Including all available information is important to strengthen the process of generating plausible values as well as to allow an unbiased analysis between questionnaire data and GPK, regardless of the size of correlations between conditioning variables and GPK. All variables (both direct regressors and factor scores from the PCA) that are included in the conditioning model were scored so that they have no missing information (by giving cases with missing data the national mean or mode of the respective variable) and (dummy) missing indicators will be added to the model. School differences were accounted for by adding a variable reflecting the average GPK score (adjusted for the contribution of each respondent) as well as explicit stratification variables. Information about the coding of questionnaire items for conditioning is presented in Annex H.

The plausible values were transformed to an international metric, where the average score was set to 250 and the standard deviation to 50 for the international dataset using senate weights. This transformation was achieved using the following formula:

$$\hat{\theta}'_n = 250 + 50 \left( \frac{\theta_n - \bar{\theta}}{\sigma_{\theta}} \right)$$

where  $\hat{\theta}'_n$  are the GPK estimates (plausible values) in the international reporting metric,  $\theta_n$  the original estimates (in logits), while  $\bar{\theta}$  and  $\sigma_{\theta}$  are the corresponding GPK mean (-0.24) and standard deviation (1.39), computed as the average of all five plausible values with weights assigning equal weight to each national sample. This transformation was applied to each of the five plausible values.

## 12.9. Using plausible values to estimate standard errors for GPK scores

When estimating standard errors for statistics based on teachers' GPK scores, it is important to consider the imputation variance that provides an estimate of the measurement error. While each plausible value constitutes an unbiased estimate of the population value, all five plausible values must be used to get an accurate estimate of the associated uncertainty, which is not only due to sampling variance, but also to imputation variance.

Concretely, if  $q$  is the population average of GPK (at the level of the combined sample, individual countries or any sub-groups within national samples) any statistic of interest  $\mu_{\theta}^p$  related to GPK should be computed using each of the  $P$  plausible values:

$$\mu_{\theta} = \frac{1}{P} \sum_{p=1}^P \mu_{\theta}^p$$

Similarly, estimates of the sampling variance  $SV_{\mu}$  is calculated as the average of the sampling variance for each plausible value  $SV_{\mu}^p$ :

$$SV_{\mu} = \frac{1}{P} \sum_{p=1}^P SV_{\mu}^p$$

Use of the  $P$  plausible values for data analysis also allows one to estimate the amount of error associated with the measurement of GPK. The measurement variance or imputation variance  $IV_p$  is computed as:

$$IV_p = \frac{1}{P-1} \sum_{p=1}^P (\mu_{\theta}^p - \mu_{\theta})^2$$

Here,  $\mu_{\theta}^p$  is the statistic of interest computed on each plausible value  $p$  and  $\mu_{\theta}$  is the mean statistic based on all  $P$  plausible values.

The estimate of the total variance  $TV_{\mu}$ , consisting of sampling variance and imputation variance, can be computed as:

$$TV_{\mu} = SV_{\mu} + \left( 1 + \frac{1}{P} \right) IV_{\mu}$$

The estimate of the final standard error  $SE_{\mu}$  is equal to:

$$SE_{\mu} = \sqrt{TV_{\mu}}$$

## 12.10. The development of a described scale

One of the objectives of TALIS TKS was to establish a described scale of GPK as a reference point for further cross-national assessments. Following 2PL IRT analysis and calibration, an RP67 value (the required proficiency associated with a 67% probability of success) was derived for each item.

The standardised item difficulty  $\delta'_i$  for each item can be obtained by applying the following transformation to the item difficulty in its original metric  $\delta_i$ :

$$\delta'_i = 250 + 50 \times \frac{\left(\delta_i + \ln\left(\frac{0.67}{0.33}\right) - (-0.34)\right)}{1.39}$$

For the final description, so-called Thurstonian thresholds were used, which were generated by ACER ConQuest based on the same scaling model assuming an item response probability of RP67. While in the case of SMC items the Thurstonian threshold is equivalent to the scaled item location, for CMC items there is one threshold for each step. Thurstonian thresholds were then ordered by their RP67 values – that is, by increasing levels of required proficiency – and draft item descriptors were developed to summarise the knowledge being assessed in each item.

Using these descriptors, a content-focused analysis was conducted to identify potential cut points along the proficiency continuum – specifically, locations where there were noticeable shifts in the cognitive demand or conceptual complexity of the items, suggesting a qualitative increase in the underlying proficiency. To support the development of a described scale, two cut points were identified to divide the scale into three levels. This approach was chosen to balance interpretability with empirical grounding, given the relatively modest number of items in the assessment of GPK. While the middle level is bounded, the lower and upper levels are only defined by the cut points and otherwise unbounded. This structure reflects the current distribution of item difficulties and allows for meaningful distinctions in knowledge without using a more fine-grained approach in view of a limited number of items that were used in this first assessment of GPK. The chosen approach preserves the capacity to refine or expand the scale in future assessment cycles, if additional items are introduced at the lower or upper ends. The broader span of the upper level, in particular, accommodates the clustering of more conceptually demanding items at the higher end of the scale.

The scatterplot below (Figure 12.5) shows the distribution of items by RP67 across the logit scale (x axis) and by rank order (y axis). The red vertical lines and associated brackets represent the proposed cut points and levels for the described scale.

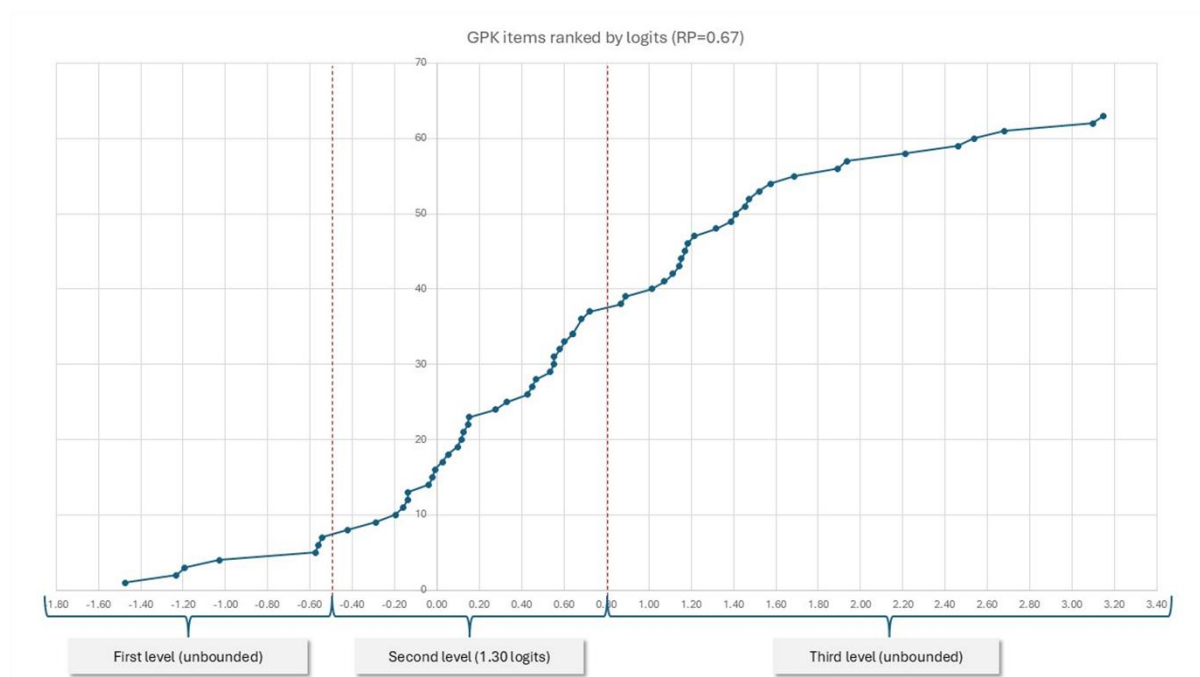
The first level is considered foundational knowledge, consisting largely of basic practical knowledge of how to engage, motivate and manage students to maintain a productive learning environment. This level is indicative of knowledge perhaps held by teachers with practical experience of the classroom but limited formal training in codified or theoretical knowledge. Seven item thresholds in the assessment correspond to this level, which encompasses GPK below -0.5 logits (241 score points in the final reporting metric) and has no lower bound.

The second level describes knowledge encompassing a broad range of established theoretical and/or more specialised, codified pedagogical knowledge. This level is indicative of knowledge that teachers would be expected to gain from formal teacher training. Thirty item thresholds correspond to this level, which ranges from -0.5 logits (241 points) to 0.8 logits (287 points).

The third and highest level describes more nuanced and complete knowledge of concepts included in the previous level. This level is indicative of more updated or academic knowledge, particularly towards the

higher end. Twenty-six item thresholds correspond to this level, which is defined by GPK at or above 0.8 logits (287 points).

**Figure 12.5. Scatterplot showing GPK scale cut points of item-step thresholds and rank order**



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## Notes

<sup>1</sup> While acknowledging that only eight countries participated in TALIS TKS, the term “international sample” is used to refer to the combined dataset including data from all eight participants.

<sup>2</sup> The name for such a map was introduced by Wilson and Draney (2002<sub>[14]</sub>) in honour of the psychometrics expert Ben Wright (University of Chicago).

<sup>3</sup> For this review, the individual parts of complex multiple-choice (CMC) items were included as separate items.

## Annex A. Consortium and experts

### International Association for the Evaluation of Educational Achievement (IEA) Hamburg (Hamburg, Germany) – International study centre

#### *Management and direction*

- Steffen Knoll (Study Director)
- Anja Waschke (Study Director)
- Ralph Carstens (Senior Strategic Advisor, Lead Conceptual Development)
- Eleonora Kolomiets (Study Coordinator, 2022 onwards)
- Mira Bocti (Study Coordinator, 2023 to 2024)
- Megan Sim (Study Coordinator, 2021 to 2023)
- Huyen Thi Thu Nguyen (Study Coordinator, 2021 to 2023)
- Xiao Xiao (Study Coordinator, 2021)

#### *Data management, adaptation and layout verification*

- Adriana Viteri (Lead Data Manager, 2022 to 2025)
- Darrell Gwaltney (Data Manager, 2021 to 2022, 2025)
- Mark Cockle (Data Manager, 2023)
- Kamil Kowolik (Data Manager, 2024 onwards)
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- Alena Becker (Senior Research Analyst, 2020 to 2022)
- Clara Beyer (Research Analyst)
- Viktoria Boehm (Research Analyst)
- Renato Coppi (Research Analyst)
- Tim Daniel (Research Analyst)
- Osman Deger (Student Assistant, 2022 to 2024)
- Ikram El Jabiry (Student Assistant)
- Isbat Hasnat (Research Analyst)
- Wolfram Jarchow (Research Analyst)
- Svenja Kalmbach (Research Analyst, 2021 to 2024)
- Inderawes Khalil (Research Analyst, 2021 to 2023)
- Juliane Kobelt (Research Analyst)
- Adam Kotb (Student Assistant, 2023 to 2024)
- Hannah Kowolik (Research Analyst)
- Chen-Ho Lee (Research Analyst)



- Jurij Lenar (Research Analyst)
- Widiyanto Persadha (Research Analyst)
- Valentina Rivera Toloza (Research Analyst, 2021 to 2023)
- Heiko Sibberns (Senior Research Advisor)
- Xiao Sui (Research Analyst)
- Daniel Ugurel (Research Analyst)
- Duygu Uyar (Research Analyst)
- Vanisa Vongphanakhone (Research Analyst)
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### ***Sampling***

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- Rodrigo Leyton (Research Analyst, 2022 onwards)
- Sabine Meinck (Co-head Research and Analysis Unit)
- Maximiliano Romero (Research Analyst, 2021 to 2024)
- Duygu Savaşçı-Smith (Research Analyst)
- Refilwe Setimela (Research Analyst, 2024 onwards)
- Hannah Smith (Research Analyst, 2020 to 2021)
- Felix Süttmann (Research Analyst, 2021 to 2022)
- Sabine Tieck (Senior Research Analyst, Sampling Team Lead)
- Pablo Torres Irribarra (Research Analyst, 2021 to 2024)

### ***Scaling and analysis***

- Mojca Rožman (Senior Research Analyst, Team Lead, 2022 onwards)
- Agnes Stancel-Piątak (Senior Research Analyst, Team Lead, 2020 to 2022)
- Purya Baghaei Moghadam (Senior Research Analyst)
- Falk Brese (Senior Research Analyst)
- Minge Chen (Research Analyst)
- Andres Christiansen (Senior Research Analyst)
- Alec Kennedy (Senior Research Analyst)
- Yuan-Ling Liaw (Senior Research Analyst)
- Ana Maria Mejia-Rodríguez (Senior Research Analyst)
- Maximiliano Romero (Research Analyst, 2024 onwards)
- Andres Ignacio Strello Toledo (Senior Research Analyst)
- Rolf Strietholt (Co-head Research and Analysis Unit)
- Pablo Torres Irribarra (Research Analyst, 2024 onwards)

### ***Software development (IEA StudyExpert)***

- Guido Martin (Lead)
- Sascha da Silva Burger (Quality Assurance)
- Sven Flachsbarth (Quality Assurance, 2022 to 2023)
- Christian Harries (Developer)
- André Schäfer (Quality Assurance)
- Katharina Sedelmayer (Developer)
- Harpreet Singh (Developer)
- Daniela Specks (Quality Assurance)
- Sheung Kong Tai (Developer)
- Sujith Thulaseedharan (Quality Assurance)

### ***Software development (IEA DME, IEA DPE, IEA WinW3S, IEA IDB Analyzer)***

- Yasin Afana (Research Analyst)
- Mohamadreza Atrian (Developer)
- Limiao Duan (Developer)
- Marwan Elkholy (Student Assistant, 2022 to 2023)
- Maïke Junod (Developer)
- Marius Kaltenbach (Developer)
- Delnaz Mohebigilani (Developer)
- Tam Nguyen (Developer)
- Meng Xue (Senior Advisor, Unit Head)

### ***Contracts, events and administration***

- Mira Bocti (Event Coordinator, 2024 onwards)
- Connie Crossman (Unit Coordinator)
- Aisha Elsayed (SharePoint Administrator)
- Eva Feron (Unit Head International Studies)
- Christian Groth (Finance Director)
- Juliane Hencke (Director)
- Laiza Souza (Event Coordinator, 2021 to 2024)
- Bettina Wietzorek (SharePoint Administrator)
- Viola Wittmann (Contracts)

### **IEA Amsterdam (Amsterdam, the Netherlands)**

- Betina Borisova (Data Protection Officer)
- Jan-Peter Broek (Financial Director, 2023 onwards)
- Roel Burgers (Financial Director, 2021 to 2023)
- David Ebbs (Senior Research Officer, Lead Translation Verification)
- Kateřina Hartmanová (Research Officer, 2021 to 2024)

- Florence Mitchell-Green (Junior Research Officer, 2024 onwards)
- Marta Moreno Hidalgo (Research Officer)
- Lauren Musu (Head Translation Verification and International Quality Control)
- Tahira Qadri (Research Officer)
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### **cApStAn Linguistic Quality Control (Brussels, Belgium)**

- Josiane Tyburn (Lead Project Manager)
- Steve Dept (Founding Partner)
- Elica Krajčeva (Senior Project Manager, Cross-cultural Survey Translation and Adaptation)
- Roberta Lizzi (Senior Project Manager, External Human Resources Director)
- Adrien Mathot (Translation Technologist)
- Manuel Souto Pico (Lead Translation Technologist)
- Laura Wayrynen (Operations Director)

### **Australian Council for Educational Research (ACER, Melbourne, Australia)**

- Wolfram Schulz (Framework Lead, Project Lead 2023 onwards)
- Pina Tarricone (Project Lead, 2021 to 2023)
- Jonathan Heard (Test Developer, Deputy Project Lead 2023 onwards)
- John Ainley (Framework Lead)
- Nicola Andrews (Test Developer)
- Trish Dowsett (Test Developer)
- Eunjung Lee (Data Analyst)
- Gregory Macaskill (Data Analyst)
- Juliette Mendelovits (Supervising Test Developer)
- Ray Peck (Lead Test Development, 2021)
- Toby Simmer (Administrative Officer)
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### **RAND Europe (Cambridge, United Kingdom)**

- Marilyn Groom (Research Analyst, Project Lead, 2022 to 2024, 2025 onwards)
- Miguel Subosa (Research Analyst, Project Lead, 2024 to 2025)
- Miriam Broeks (Research Analyst, Project Lead, 2021 to 2022)
- Elena Rosa Brown (Senior Researcher)
- Fin Oades (Research Assistant)

## Experts

### ***TALIS core survey Questionnaire Expert Group (QEG)***

- Heather Price (Learning Policy Institute, United States, Chair)
- Charalambos Charalambous (University of Cyprus, Cyprus)
- Tracy Durksen (University of New South Wales, Australia)
- Hilary Hollingsworth (ACER, Australia)
- Stefan Johansson (University of Gothenburg, Sweden)
- Ridwan Maulana (University of Groningen, The Netherlands)
- Lorena Ortega (University of Chile, Chile)
- Oren Pizmony-Levy (Teachers College at Columbia University, United States)
- Ronny Scherer (University of Oslo, Norway)
- Anna Qian Sun (Rowan University, United States)
- Kristen Weatherby (Weatherby Education Studies, United Kingdom)

### ***TALIS Starting Strong Questionnaire Expert Group (ECEC QEG)***

- Lynn A. Karoly (RAND Corporation, United States, Chair)
- Julie Belanger (Better Purpose, United Kingdom)
- Alejandra Cortázar (ECEC Researcher and Consultant, Chile)
- Rahel Dreyer (Extended Member, Alice Salomon University of Applied Sciences, Germany)
- Mine Göl-Güven (Boğaziçi University, Türkiye)
- Maelis Karlsson Lohmander (Extended Member, University of Gothenburg, Sweden)
- Thomas Moser (University of Stavanger, Norway)
- Abbie Raikes (Extended Member, University of Nebraska Medical Center, United States)
- Yumi Yodogawa (Extended Member, Chiba University, Japan)

### ***Teacher Knowledge Expert Group (TKEG)***

- Jonathan Heard (ACER, Australia, Chair 2023 onwards)
- Pina Tarricone (ACER, Australia, Chair 2020 to 2023)
- Charalambos Charalambous (University of Cyprus, Cyprus)
- Drew Gitomer (Rutgers University, United States)
- Liina Malva (Tallinn University, Estonia)
- Tamar Voss (Extended Member, University of Freiburg, Germany)

### ***Technical Advisory Group (TAG)***

- Timothy Kennell (US Census Bureau, United States, Chair)
- Mick Couper (University of Michigan, United States)
- Paul Leseman (Utrecht University, The Netherlands)
- Bart Meuleman (University of Leuven, Belgium)
- Christian Monseur (University of Liège, Belgium)

***Sampling Referee***

- Jean Dumais (Previously Statistics Canada, Gatineau, Canada)

***Translation Referee***

- Michèle Ernst Stähli (Swiss Centre of Expertise in the Social Sciences, Switzerland)

## Annex B. Sampling forms

This annex presents the sampling forms that were used to collect information from countries/territories before the school sampling process started.

Figure A B.1. Sampling form 1

| Sampling Form 1                                                                                                                                                                                                                                                                                                                                   |                                                           | General Information |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|---------------------|
| <i>See Chapter 2 of SOP Unit 1 - Sampling of Schools for more details</i>                                                                                                                                                                                                                                                                         |                                                           |                     |
| <b>TALIS 2024 Participant:</b>                                                                                                                                                                                                                                                                                                                    | <input type="text"/>                                      |                     |
| <b>National Project Manager:</b>                                                                                                                                                                                                                                                                                                                  | <input type="text"/>                                      |                     |
| <b>National Sampling Manager:</b>                                                                                                                                                                                                                                                                                                                 | <input type="text"/>                                      |                     |
| 1. Please indicate your participation in the core survey and/or any optional modules.                                                                                                                                                                                                                                                             |                                                           |                     |
| <input type="checkbox"/> ISCED level 2 (core survey)                                                                                                                                                                                                                                                                                              | <input type="checkbox"/> ISCED level 02 (Starting Strong) |                     |
| <input type="checkbox"/> ISCED level 1                                                                                                                                                                                                                                                                                                            | <input type="checkbox"/> Under 3 (Starting Strong)        |                     |
| <input type="checkbox"/> ISCED level 3                                                                                                                                                                                                                                                                                                            | <input type="checkbox"/> Teacher Knowledge Survey         |                     |
| 2. Specify the expected survey administration period for the Field Trial (between February and March 2023) and the Main Survey (between February and April 2024 for Northern Hemisphere countries and between June and August 2024 for Southern Hemisphere countries).<br>(For further information, see Chapter 3 of the NPM General Guidelines). |                                                           |                     |
| Expected period for Field Trial:                                                                                                                                                                                                                                                                                                                  | Expected period for Main Survey:                          |                     |
| <input type="text"/>                                                                                                                                                                                                                                                                                                                              | <input type="text"/>                                      |                     |
| 3. Specify the start and end dates of the school years in which the survey is expected to take place.                                                                                                                                                                                                                                             |                                                           |                     |
| Start date of Field Trial school year:<br>(DD-MM-YYYY)                                                                                                                                                                                                                                                                                            | Start date of Main Survey school year:<br>(DD-MM-YYYY)    |                     |
| <input type="text"/>                                                                                                                                                                                                                                                                                                                              | <input type="text"/>                                      |                     |
| End date of Field Trial school year:<br>(DD-MM-YYYY)                                                                                                                                                                                                                                                                                              | End date of Main Survey school year:<br>(DD-MM-YYYY)      |                     |
| <input type="text"/>                                                                                                                                                                                                                                                                                                                              | <input type="text"/>                                      |                     |
| 4. Specify the expected date of submission of the sampling frame to the IEA.                                                                                                                                                                                                                                                                      |                                                           |                     |
| <input type="text"/>                                                                                                                                                                                                                                                                                                                              |                                                           |                     |
| 5. Specify by when the sample(s) of schools/ECEC settings should be ready.                                                                                                                                                                                                                                                                        |                                                           |                     |
| <input type="text"/>                                                                                                                                                                                                                                                                                                                              |                                                           |                     |
| 6. Specify the language(s) in which the survey will be administered.                                                                                                                                                                                                                                                                              |                                                           |                     |
| <input type="text"/>                                                                                                                                                                                                                                                                                                                              |                                                           |                     |
| 7. Do you wish to survey another target population (as a national option)? If so, please specify.                                                                                                                                                                                                                                                 |                                                           |                     |
| <input type="text"/>                                                                                                                                                                                                                                                                                                                              |                                                           |                     |
| <i>Please upload the completed forms to SharePoint</i>                                                                                                                                                                                                                                                                                            |                                                           |                     |

### Figure A B.2. Sampling form 2

[illegible]

Figure A B.3. Sampling form 3

| Sampling Form 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Co-ordination of Studies                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <i>See Chapter 3 of SOP Unit 1 - Sampling of Schools for more details</i>                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                          |
| <b>TALIS 2024 Participant:</b> <input style="width: 90%; height: 20px;" type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                          |
| 1. If you plan to participate in multiple target populations, please indicate (where relevant) whether any schools/ECEC settings contain multiple target populations. <i>(Click in the box and on the right-hand arrow to see the drop-down menu.)</i>                                                                                                                                                                                                                                           |                                                                                                                                          |
| <b>ISCED level 2 and ISCED level 1:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <input style="width: 90%; height: 20px;" type="text" value="Are there any schools/ECEC settings that contain both target populations?"/> |
| <b>ISCED level 2 and ISCED level 3:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <input style="width: 90%; height: 20px;" type="text" value="Are there any schools/ECEC settings that contain both target populations?"/> |
| <b>ISCED level 1 and ISCED level 02:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <input style="width: 90%; height: 20px;" type="text" value="Are there any schools/ECEC settings that contain both target populations?"/> |
| <b>ISCED level 02 and Under 3:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <input style="width: 90%; height: 20px;" type="text" value="Are there any schools/ECEC settings that contain both target populations?"/> |
| 2. If you plan to participate in any other combinations not listed above (e.g. ISCED level 2 and ISCED level 02) <b>and</b> there are schools/ECEC settings that contain both target populations, please specify these combinations. <div style="border: 1px solid black; height: 60px; margin-top: 5px;"></div>                                                                                                                                                                                 |                                                                                                                                          |
| 3. If you would like to co-ordinate the TALIS school/ECEC setting sample with any other assessments/studies, please list the assessments/studies and how you wish the overlap control to be done (i.e. minimum overlap or maximum overlap). <i>(Please note that the feasibility of overlap control with other studies will be evaluated and discussed during country consultations with the IEA Sampling Team.)</i> <div style="border: 1px solid black; height: 60px; margin-top: 5px;"></div> |                                                                                                                                          |
| 4. In this field, you can enter any further information or comments on the co-ordination of studies. <div style="border: 1px solid black; height: 60px; margin-top: 5px;"></div>                                                                                                                                                                                                                                                                                                                 |                                                                                                                                          |
| <b><i>Please upload the completed forms to SharePoint</i></b>                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                          |



Figure A B.4. Sampling form 4

| Sampling Form 4                                                                                                          |                                                                          | Coverage and Exclusions                                                    |                                                                            |                                                                            |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <i>See Chapter 3 of SOP Unit 1 - Sampling of Schools for more details</i>                                                |                                                                          |                                                                            |                                                                            |                                                                            |
| <b>TALIS 2024 Participant:</b>                                                                                           | <div style="border: 1px solid black; height: 20px; width: 100%;"></div>  |                                                                            |                                                                            |                                                                            |
| <b>Target Population:</b>                                                                                                | <div style="border: 1px solid black; height: 20px; width: 100%;"></div>  |                                                                            |                                                                            |                                                                            |
|                                                                                                                          | <b># of schools</b>                                                      | <b># of teachers</b>                                                       | <b># of students</b>                                                       |                                                                            |
| 1. Total enrolment in the target population:                                                                             | [a]                                                                      | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   |
| 2. School-level exclusions (if applicable):                                                                              |                                                                          |                                                                            |                                                                            |                                                                            |
| <b>Description of exclusions</b>                                                                                         | <b># of schools</b>                                                      | <b># of teachers</b>                                                       | <b># of students</b>                                                       |                                                                            |
| 1.                                                                                                                       | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   |                                                                            |
| 2.                                                                                                                       | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   |                                                                            |
| 3.                                                                                                                       | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   |                                                                            |
| 4.                                                                                                                       | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   |                                                                            |
| 5.                                                                                                                       | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   |                                                                            |
| TOTAL: <i>(Sum of exclusions - Calculated automatically)</i>                                                             | [b]                                                                      | -                                                                          | -                                                                          | -                                                                          |
| 3. <b>Percentage of school-level exclusions:</b><br><i>(Box [b] ÷ Box [a])</i>                                           | [1]                                                                      | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> % | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> % | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> % |
| 4. Total enrolment after school-level exclusions:<br><i>(Box [c] = Box [a] - Box [b])</i>                                | [c]                                                                      | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   |
| 5. Within-school exclusions (if applicable):                                                                             |                                                                          |                                                                            |                                                                            |                                                                            |
| <b>Description of exclusions</b>                                                                                         | <b># of schools</b>                                                      | <b># of teachers</b>                                                       | <b># of students</b>                                                       |                                                                            |
| 1.                                                                                                                       | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   |                                                                            |
| 2.                                                                                                                       | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   |                                                                            |
| 3.                                                                                                                       | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   | <div style="border: 1px solid black; width: 100px; height: 20px;"></div>   |                                                                            |
| TOTAL: <i>(Sum of exclusions - Calculated automatically)</i>                                                             | [d]                                                                      | -                                                                          | -                                                                          | -                                                                          |
|                                                                                                                          | <b>schools</b>                                                           | <b>teachers</b>                                                            | <b>students</b>                                                            |                                                                            |
| 6. <b>Expected percentage of within-school exclusions:</b><br><i>(Box [d] ÷ Box [c])</i>                                 | [2]                                                                      | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> % | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> % | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> % |
| 7. <b>Expected percentage of reduced coverage and exclusions in total:</b><br><i>(Box [1] + (1 - Box [1]) × Box [2])</i> |                                                                          | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> % | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> % | <div style="border: 1px solid black; width: 100px; height: 20px;"></div> % |
| 8. Please list any changes in school-level or within-school exclusions compared to previous TALIS cycles.                | <div style="border: 1px solid black; height: 80px; width: 100%;"></div>  |                                                                            |                                                                            |                                                                            |

*Please upload the completed forms to SharePoint*

Figure A B.5. Sampling form 5

| <b>Sampling Form 5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Stratification</b>                                      |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--------------------------|-----------------|--|--|--|------|-------------|-----------------|---|--|--|--|---|--|--|--|---|--|--|--|---|--|--|--|---|--|--|--|---|--|--|--|
| <i>See Chapter 3 of SOP Unit 1 - Sampling of Schools for more details</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| <b>TALIS 2024 Participant:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <div style="border: 1px solid black; height: 20px;"></div> |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| <b>Target Population:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <div style="border: 1px solid black; height: 20px;"></div> |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| <b>Stratification of schools</b><br>1. List and describe the variables to be used for stratification in order of importance.<br><i>(Please note that the choice of variables used for explicit or implicit stratification will be discussed during consultations with the IEA Sampling Team.)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center; padding: 5px;">Stratification Variables</th> </tr> <tr> <th style="width: 5%;"></th> <th style="width: 25%; text-align: center; padding: 5px;">Name</th> <th style="width: 50%; text-align: center; padding: 5px;">Description</th> <th style="width: 20%; text-align: center; padding: 5px;"># of categories</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">1</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">6</td><td></td><td></td><td></td></tr> </tbody> </table> |                                                            | Stratification Variables |                 |  |  |  | Name | Description | # of categories | 1 |  |  |  | 2 |  |  |  | 3 |  |  |  | 4 |  |  |  | 5 |  |  |  | 6 |  |  |  |
| Stratification Variables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Name                                                       | Description              | # of categories |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| Include additional information if needed:<br><div style="border: 1px solid black; height: 80px; margin-top: 5px;"></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| 2. Do you intend to present any comparative results for specific groups of schools in your national reports? Do you wish to increase the school sample size in some strata? If so, please specify these groups of schools below.<br><div style="border: 1px solid black; height: 80px; margin-top: 5px;"></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |
| <i>Please upload the completed forms to SharePoint</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                            |                          |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |

Figure A B.6. Sampling form 6

| Sampling Form 6                                                                                                                                                                            | Measure of Size (MOS) and Sampling Frame   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| <i>See Chapter 4 of SOP Unit 1 - Sampling of Schools for more details</i>                                                                                                                  |                                            |
| <b>TALIS 2024 Participant:</b>                                                                                                                                                             | <input style="width: 90%;" type="text"/>   |
| <b>Target Population:</b>                                                                                                                                                                  | <input style="width: 90%;" type="text"/>   |
| 1. Specify the measure of size (MOS) to be used.                                                                                                                                           |                                            |
| <input style="width: 90%;" type="text"/>                                                                                                                                                   |                                            |
| <i>Click in the box and on the right-hand arrow to see the drop-down menu</i>                                                                                                              |                                            |
| If "Other", please describe:                                                                                                                                                               |                                            |
| <input style="width: 90%;" type="text"/>                                                                                                                                                   |                                            |
| 2. Specify the year for which enrolment data will be used for the school MOS.                                                                                                              | <input style="width: 150px;" type="text"/> |
| 3. Specify the source of the sampling frame.                                                                                                                                               |                                            |
| <input style="width: 90%;" type="text"/>                                                                                                                                                   |                                            |
| 4. If a frame other than a single-level sampling frame (list of all schools) is to be used, please provide a preliminary description of the information available to construct this frame. |                                            |
| <input style="width: 90%;" type="text"/>                                                                                                                                                   |                                            |
| 5. In this field, you can enter any further information or comments on the sampling frame, or further requests for the selection of your school sample.                                    |                                            |
| <input style="width: 90%;" type="text"/>                                                                                                                                                   |                                            |
| <b><i>Please upload the completed forms to SharePoint</i></b>                                                                                                                              |                                            |

Figure A B.7. Sampling form 7

| Sampling Form 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Non-Response Bias Analysis                                              |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------|-----------------|--|--|--|------|-------------|-----------------|---|--|--|--|---|--|--|--|---|--|--|--|---|--|--|--|---|--|--|--|---|--|--|--|---|--|--|--|---|--|--|--|---|--|--|--|----|--|--|--|
| <i>See Chapter 7 of SOP Unit 1 - Sampling of Schools for more details</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| <b>TALIS 2024 Participant:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <div style="border: 1px solid black; height: 20px; width: 100%;"></div> |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| <b>Target Population:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <div style="border: 1px solid black; height: 20px; width: 100%;"></div> |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| <p>1. List and describe the variables available for use in non-response bias analysis.<br/> <i>(Please only list variables for which the data are currently available. The planning of non-response bias analyses will be discussed during consultations with the IEA Sampling Team.)</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center; padding: 5px;">Non-Response Bias Analysis Variables</th> </tr> <tr> <th style="width: 5%;"></th> <th style="width: 25%; text-align: center; padding: 5px;">Name</th> <th style="width: 50%; text-align: center; padding: 5px;">Description</th> <th style="width: 20%; text-align: center; padding: 5px;"># of categories</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">1</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">2</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">3</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">4</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">5</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">6</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">7</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">8</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">9</td><td></td><td></td><td></td></tr> <tr><td style="text-align: center;">10</td><td></td><td></td><td></td></tr> </tbody> </table> |                                                                         | Non-Response Bias Analysis Variables |                 |  |  |  | Name | Description | # of categories | 1 |  |  |  | 2 |  |  |  | 3 |  |  |  | 4 |  |  |  | 5 |  |  |  | 6 |  |  |  | 7 |  |  |  | 8 |  |  |  | 9 |  |  |  | 10 |  |  |  |
| Non-Response Bias Analysis Variables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Name                                                                    | Description                          | # of categories |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| <p>Include additional information if needed:</p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |
| <i>Please upload the completed forms to SharePoint</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                         |                                      |                 |  |  |  |      |             |                 |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |   |  |  |  |    |  |  |  |

## Annex C. Target and survey populations

This annex presents statistics for totals of the target and survey populations per module, population and country/territory. All figures are based on information provided by the participating countries/territories in Sampling Form 4 and are in line with the information given in the school frame. Note that in many instances, national statistics on the number of teachers/members of staff were not available, leading to empty cells in the respective tables.

The annex further presents the excluded types of schools/settings and the respective exclusion rates. In most instances, exclusion rates were calculated based on the numbers provided by the participating countries/territories in Sampling form 4. In a few cases, sampled schools were excluded during survey administration because they were labelled incorrectly on the school/setting lists or because the actual situation of the schools/settings had changed over time. These within-sample exclusions are considered in the exclusion rates. However, within-sample exclusions are not reflected in the survey population as indicated in Sampling Form 4.

## Target and survey populations: International Standard Classification of Education (ISCED) level 2

Figure A C.1. Exclusion rates, ISCED level 2 schools

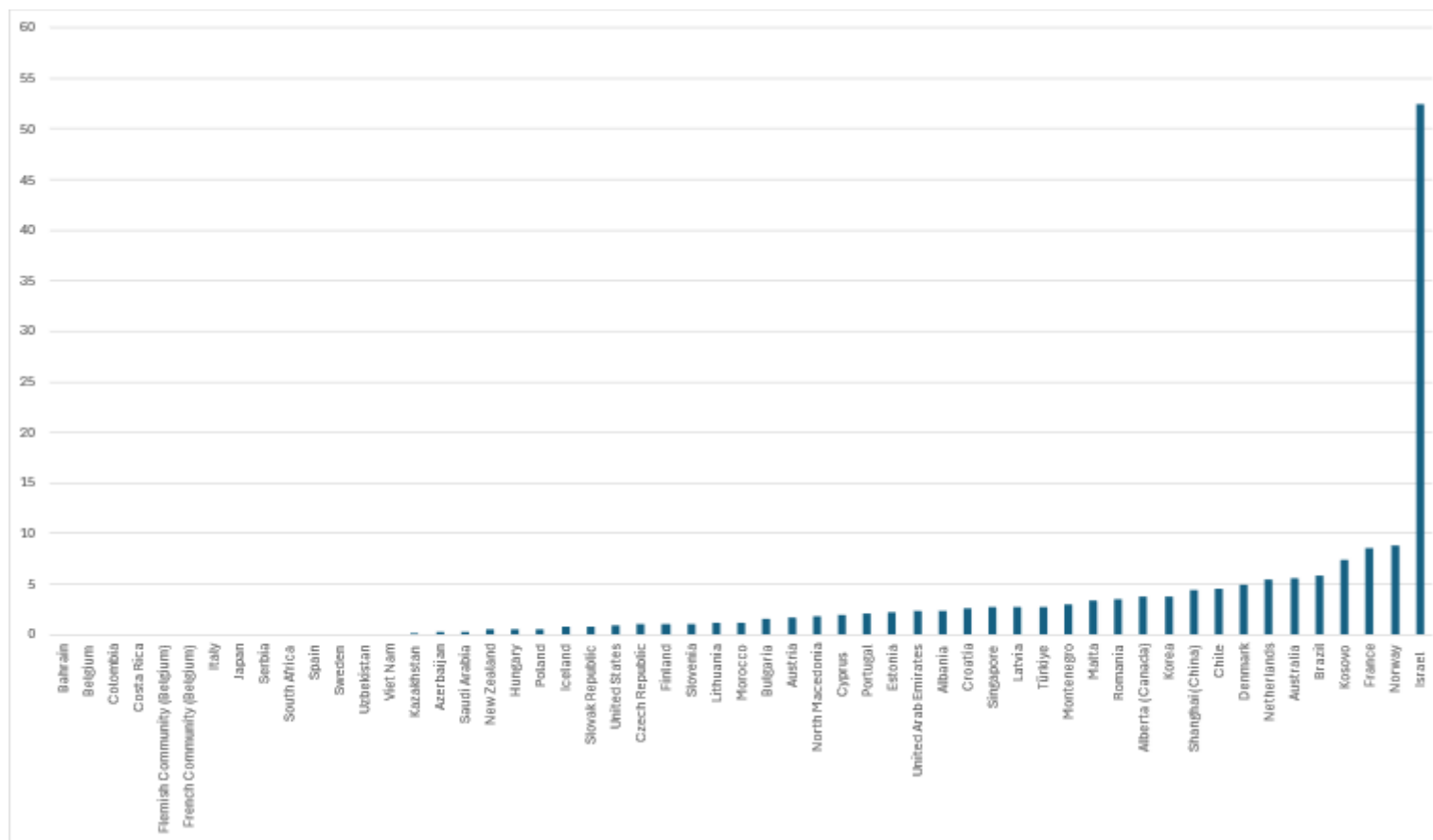


Figure A C.2. Exclusion rates, ISCED level 2 teachers

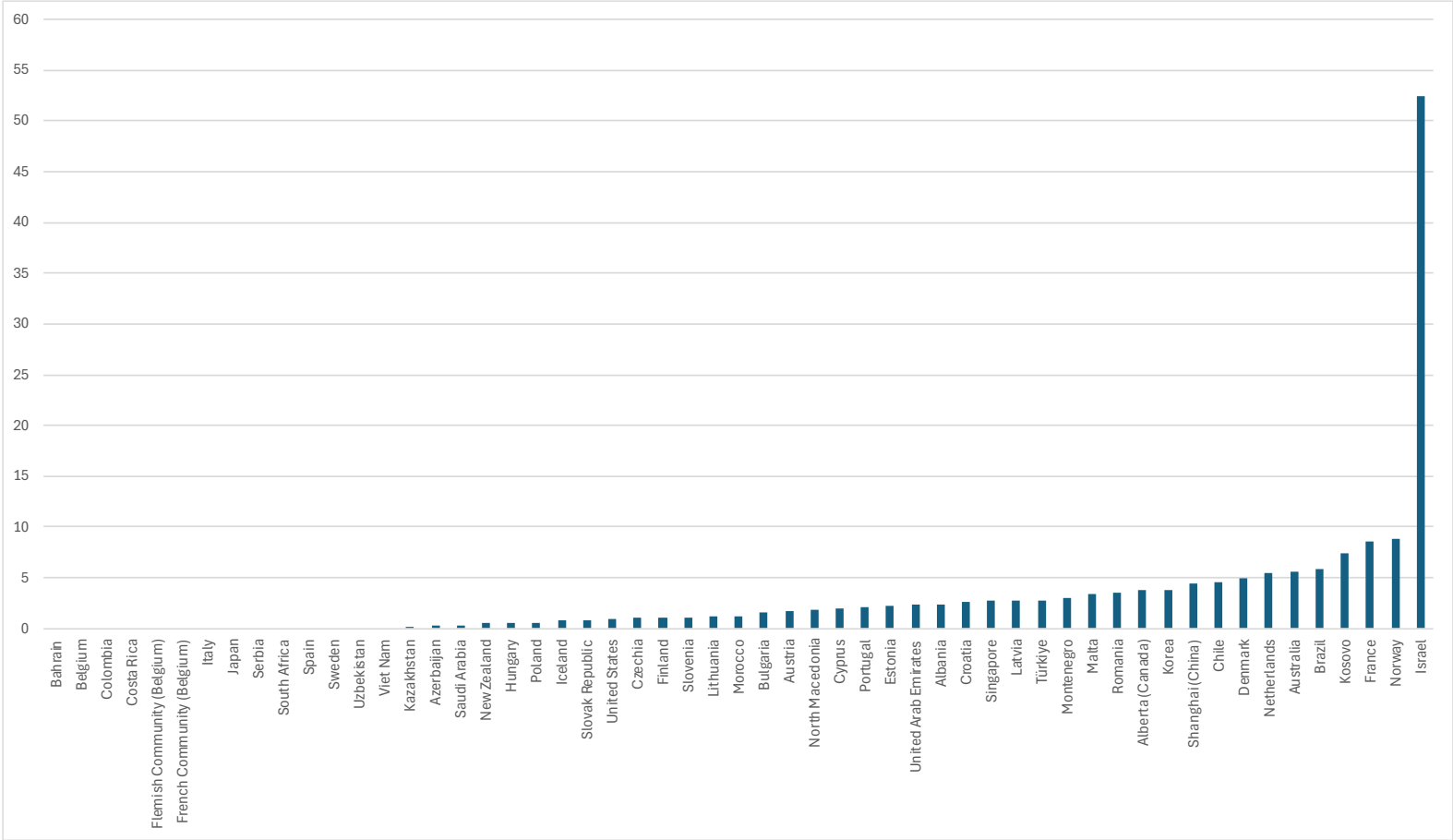


Table A C.1. Target and survey populations: ISCED level 2

| Country/territory           | Schools           |                   |                                                                               |                | Teachers          |                   |                                                                               |                | Notes                                                                                                                                               |
|-----------------------------|-------------------|-------------------|-------------------------------------------------------------------------------|----------------|-------------------|-------------------|-------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | Target population | Survey population | Exclusions                                                                    | Exclusion rate | Target population | Survey population | Exclusions                                                                    | Exclusion rate |                                                                                                                                                     |
| Albania                     | 1 141             | 1 114             | Small schools (<4 ISCED level 2 teachers, 2.4%)                               | 2.4            | 13 524            | 13 465            | Small schools (<4 ISCED level 2 teachers, 0.4%)                               | 0.4            |                                                                                                                                                     |
| Alberta (Canada)            | 1 234             | 1 187             | First Nation Bands operated schools (3.0%), federal schools (0.8%)            | 3.8            | -                 | -                 | First Nation Bands operated schools (1.4%), federal schools (0.1%)            | 1.5            | The teacher exclusion rate is based on the number of ISCED level 2 students.                                                                        |
| Australia                   | 2 817             | 2 659             | Remote schools (4.8%), small schools (<4 ISCED levels 1 and 2 teachers, 0.9%) | 5.6            | 103 751           | 102 935           | Remote schools (0.7%), small schools (<4 ISCED levels 1 and 2 teachers, 0.0%) | 0.8            | Teacher numbers were estimated by the country.                                                                                                      |
| Austria                     | 1 493             | 1 490             | Slovene school (0.1%), international schools (partially within-sample, 1.6%)  | 1.7            | 41 922            | 41 826            | Slovene school (0.1%), international schools (partially within-sample, 2.3%)  | 2.4            |                                                                                                                                                     |
| Azerbaijan                  | 4 117             | 4 104             | Georgian schools (0.1%), English schools (0.2%)                               | 0.3            | 108 550           | 108 149           | Georgian schools (0.1%), English schools (0.3%)                               | 0.4            | The target population does not include schools or teachers in the Karabakh Economic Region under the Russian peacekeeping control (status of 2022). |
| Bahrain                     | 122               | 122               |                                                                               | 0.0            | -                 | -                 |                                                                               | 0.0            | The teacher exclusion rate is based on the number of teachers in ISCED level 2 schools.                                                             |
| Belgium                     | 1 206             | 1 206             |                                                                               | 0.0            | -                 | -                 |                                                                               | 0.0            | The target population comprises the Flemish and French Communities of Belgium, not including the German community.                                  |
| Flemish Community (Belgium) | 754               | 754               |                                                                               | 0.0            | 30 865            | 30 865            |                                                                               | 0.0            |                                                                                                                                                     |



| Country/territory          | Schools           |                   |                                                                                                                                           |                | Teachers          |                   |                                                                                                                                           |                | Notes                                                                                   |
|----------------------------|-------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------|
|                            | Target population | Survey population | Exclusions                                                                                                                                | Exclusion rate | Target population | Survey population | Exclusions                                                                                                                                | Exclusion rate |                                                                                         |
| French Community (Belgium) | 452               | 452               |                                                                                                                                           | 0.0            | -                 | -                 |                                                                                                                                           | 0.0            | The teacher exclusion rate is based on the number of ISCED level 2 students.            |
| Brazil                     | 61 779            | 61 779            | Rio Grande do Sul (within-sample, 5.9%)                                                                                                   | 5.9            | 888 725           | 888 725           | Rio Grande do Sul (within-sample, 10.5%)                                                                                                  | 10.5           |                                                                                         |
| Bulgaria                   | 1 733             | 1 705             | Schools in jails (0.1%), small schools (<4 ISCED level 2 teachers, 1.5%)                                                                  | 1.6            | 25 051            | 24 957            | Schools in jails (0.1%), small schools (<4 ISCED level 2 teachers, 0.3%)                                                                  | 0.4            |                                                                                         |
| Chile                      | 5 982             | 5 810             | Insular Chile and Cabo de Hornos (0.1%), small schools (<3 ISCED level 2 teachers, 2.8%), schools in conflict zones (within-sample, 1.6%) | 4.5            | 61 211            | 60 797            | Insular Chile and Cabo de Hornos (0.1%), small schools (<3 ISCED level 2 teachers, 0.6%), schools in conflict zones (within-sample, 2.3%) | 3.0            |                                                                                         |
| Colombia                   | 14 628            | 14 628            |                                                                                                                                           | 0.0            | -                 | -                 |                                                                                                                                           | 0.0            | The teacher exclusion rate is based on the number of ISCED level 2 students.            |
| Costa Rica                 | 981               | 981               |                                                                                                                                           | 0.0            | -                 | -                 |                                                                                                                                           | 0.0            | The teacher exclusion rate is based on the number of teachers in ISCED level 2 schools. |
| Croatia                    | 886               | 863               | Czech schools (0.2%), Italian schools (1.1%), Hungarian schools (0.2%), Serbian schools (0.8%), international schools (0.2%)              | 2.6            | -                 | -                 | Czech schools (0.1%), Italian schools (0.6%), Hungarian schools (0.0%), Serbian schools (0.2%), international schools (0.1%)              | 1.1            | The teacher exclusion rate is based on the number of ISCED level 2 students.            |

| Country/territory | Schools           |                   |                                                                                                                   |                | Teachers          |                   |                                                                                                                   |                | Notes                                                                                                                                                                                                              |
|-------------------|-------------------|-------------------|-------------------------------------------------------------------------------------------------------------------|----------------|-------------------|-------------------|-------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | Target population | Survey population | Exclusions                                                                                                        | Exclusion rate | Target population | Survey population | Exclusions                                                                                                        | Exclusion rate |                                                                                                                                                                                                                    |
| Cyprus            | 102               | 100               | School in a remote location (1.0%), language other than Greek or English (1.0%)                                   | 2.0            | 4 225             | 4 190             | School in a remote location (0.5%), language other than Greek or English (0.4%)                                   | 0.8            |                                                                                                                                                                                                                    |
| Czechia           | 2 846             | 2 818             | Small schools (<3 ISCED level 2 teachers, 0.5%), Polish schools (0.4%), dance conservatories (0.2%)               | 1.0            | 53 596            | 53 318            | Small schools (<3 ISCED level 2 teachers, 0.0%), Polish schools (0.3%), dance conservatories (0.2%)               | 0.5            |                                                                                                                                                                                                                    |
| Denmark           | 1 666             | 1 590             | Small schools (<20 ISCED level 2 students, 4.0%), international schools (partially within-sample, 0.9%)           | 4.9            | -                 | -                 | Small schools (<20 ISCED level 2 students, 0.4%), international schools (partially within-sample, 0.9%)           | 1.3            | The target population comprises metropolitan Denmark, not including the autonomous territories of the Faroe Islands and Greenland.<br>The teacher exclusion rate is based on the number of ISCED level 2 students. |
| Estonia           | 398               | 393               | International schools (partially within-sample, 1.9%), ballet school (0.3%)                                       | 2.2            | 9 678             | 9 577             | International schools (partially within-sample, 2.0%), ballet school (0.3%)                                       | 2.2            |                                                                                                                                                                                                                    |
| Finland           | 733               | 725               | Language other than Finnish or Swedish (1.1%)                                                                     | 1.1            | -                 | -                 | Language other than Finnish or Swedish (0.7%)                                                                     | 0.7            | The teacher exclusion rate is based on the number of ISCED level 2 students.                                                                                                                                       |
| France            | 7 484             | 6 850             | Private non-contractual educational sector (5.6%), schools in Réunion, Mayotte and overseas collectivities (2.8%) | 8.5            | 276 380           | 265 452           | Private non-contractual educational sector (0.5%), schools in Réunion, Mayotte and overseas collectivities (3.5%) | 4.0            |                                                                                                                                                                                                                    |

| Country/territory | Schools           |                   |                                                                                              |                | Teachers          |                   |                                                                                              |                | Notes                                                                        |
|-------------------|-------------------|-------------------|----------------------------------------------------------------------------------------------|----------------|-------------------|-------------------|----------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------|
|                   | Target population | Survey population | Exclusions                                                                                   | Exclusion rate | Target population | Survey population | Exclusions                                                                                   | Exclusion rate |                                                                              |
| Hungary           | 2 836             | 2 819             | Language other than Hungarian (0.6%)                                                         | 0.6            | 39 053            | 38 835            | Language other than Hungarian (0.6%)                                                         | 0.6            |                                                                              |
| Iceland           | 146               | 146               | International school (within-sample, 0.8%)                                                   | 0.8            | -                 | -                 | International school (within-sample, 0.8%)                                                   | 0.8            | The teacher exclusion rate is based on the number of ISCED level 2 students. |
| Israel            | 2 766             | 1 315             | Schools teaching in English or French (0.1%), ultra-Orthodox schools (52.3%)                 | 52.5           | -                 | -                 | Schools teaching in English or French (0.1%), ultra-Orthodox schools (20.4%)                 | 20.4           | The teacher exclusion rate is based on the number of ISCED level 2 students. |
| Italy             | 5 879             | 5 879             |                                                                                              | 0.0            | 211 657           | 211 657           |                                                                                              | 0.0            |                                                                              |
| Japan             | 10 283            | 10 283            |                                                                                              | 0.0            | 268 417           | 268 417           |                                                                                              | 0.0            |                                                                              |
| Kazakhstan        | 6 755             | 6 744             | Uyghur schools (0.1%), English schools (0.1%)                                                | 0.2            | 246 499           | 246 113           | Uyghur schools (0.1%), English schools (0.1%)                                                | 0.2            |                                                                              |
| Korea             | 3 259             | 3 136             | Schools on islands and in remote places (3.8%)                                               | 3.8            | 100 239           | 98 889            | Schools on islands and in remote places (1.3)                                                | 1.3            |                                                                              |
| Kosovo            | 678               | 628               | Bosnian and Serbian schools (7.4%)                                                           | 7.4            | 12 424            | 11 993            | Bosnian and Serbian schools (3.5%)                                                           | 3.5            |                                                                              |
| Latvia            | 540               | 525               | Distance learning schools (1.5%), special regime school (0.2%), international schools (1.1%) | 2.8            | -                 | -                 | Distance learning schools (2.4%), special regime school (0.0%), international schools (0.7%) | 3.1            | The teacher exclusion rate is based on the number of ISCED level 2 students. |
| Lithuania         | 753               | 744               | International schools (0.5%), youth schools (0.7%)                                           | 1.2            | -                 | -                 | International schools (0.3%), youth schools (0.2%)                                           | 0.5            | The teacher exclusion rate is based on the number of ISCED level 2 students. |

| Country/territory | Schools           |                   |                                                                                                             |                | Teachers          |                   |                                                                                                             |                | Notes                                                                                                                                                                                     |
|-------------------|-------------------|-------------------|-------------------------------------------------------------------------------------------------------------|----------------|-------------------|-------------------|-------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | Target population | Survey population | Exclusions                                                                                                  | Exclusion rate | Target population | Survey population | Exclusions                                                                                                  | Exclusion rate |                                                                                                                                                                                           |
| Malta             | 58                | 56                | Schools teaching in foreign language (3.4%)                                                                 | 3.4            | 3 464             | 3 449             | Schools teaching in foreign language (0.4%)                                                                 | 0.4            |                                                                                                                                                                                           |
| Montenegro        | 167               | 162               | International English schools (3.0%)                                                                        | 3.0            | 2 617             | 2 571             | International English schools (1.8%)                                                                        | 1.8            |                                                                                                                                                                                           |
| Morocco           | 3 941             | 3 893             | International schools (1.2%)                                                                                | 1.2            | 75 409            | 74 156            | International schools (1.7%)                                                                                | 1.7            |                                                                                                                                                                                           |
| Netherlands       | 1 340             | 1 268             | Private schools (3.7%), small schools (<40 students, 1.6%)                                                  | 5.4            | -                 | -                 | Private schools (0.4%), small schools (<40 students, 0.1%)                                                  | 0.5            | The target population comprises the European Netherlands, not including the Dutch Caribbean. The teacher exclusion rate is based on the number of ISCED level 2 students.                 |
| New Zealand       | 1 727             | 1 718             | Online-only/correspondence schools (0.2%), teen parent units (0.3%)                                         | 0.5            | 35 281            | 35 024            | Online-only/correspondence schools (0.7%), teen parent units (0.1%)                                         | 0.7            | The target population comprises New Zealand, not including the associated states Cook Islands and Niue or the dependent territory Tokelau. Teacher numbers were estimated by the country. |
| North Macedonia   | 340               | 334               | Language other than Macedonian or Albanian (1.8%)                                                           | 1.8            | 10 045            | 9 931             | Language other than Macedonian or Albanian (1.1%)                                                           | 1.1            |                                                                                                                                                                                           |
| Norway            | 1 207             | 1 101             | Sami language schools (0.5%), international schools (2.0%), small schools (<4 ISCED level 2 teachers, 6.3%) | 8.8            | 24 805            | 24 196            | Sami language schools (0.2%), international schools (1.5%), small schools (<4 ISCED level 2 teachers, 0.8%) | 2.5            |                                                                                                                                                                                           |
| Poland            | 12 622            | 12 543            | International schools (0.2%), artistic schools (0.5%)                                                       | 0.6            | 240 742           | 239 146           | International schools (0.2%), artistic schools (0.5%)                                                       | 0.7            |                                                                                                                                                                                           |

| Country/territory | Schools           |                   |                                                                                          |                | Teachers          |                   |                                                                                          |                | Notes                                                                                    |
|-------------------|-------------------|-------------------|------------------------------------------------------------------------------------------|----------------|-------------------|-------------------|------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------|
|                   | Target population | Survey population | Exclusions                                                                               | Exclusion rate | Target population | Survey population | Exclusions                                                                               | Exclusion rate |                                                                                          |
| Portugal          | 1 217             | 1 192             | Schools with a non-Portuguese curriculum (2.1%)                                          | 2.1            | 45 232            | 44 621            | Schools with a non-Portuguese curriculum (1.4%)                                          | 1.4            | The target population comprises mainland Portugal, not including the Azores and Madeira. |
| Romania           | 4 731             | 4 566             | Small schools (<26 ISCED level 2 students, 3.5%)                                         | 3.5            | -                 | -                 | Small schools (<26 ISCED level 2 students, 0.4%)                                         | 0.4            | The teacher exclusion rate is based on the number of ISCED level 2 students.             |
| Saudi Arabia      | 7 996             | 7 972             | International schools with foreign curriculum (0.3%)                                     | 0.3            | 133 277           | 133 140           | International schools with foreign curriculum (0.1%)                                     | 0.1            |                                                                                          |
| Serbia            | 1 128             | 1 128             |                                                                                          | 0.0            | 40 373            | 40 373            |                                                                                          | 0.0            |                                                                                          |
| Shanghai (China)  | 735               | 703               | Foreigners' schools (3.7%), special schools for students with behaviour problems (0.7%)  | 4.4            | 49 315            | 48 052            | Foreigners' schools (2.3%), special schools for students with behaviour problems (0.2%)  | 2.6            |                                                                                          |
| Singapore         | 188               | 183               | International schools (2.7%)                                                             | 2.7            | 11 630            | 11 440            | International schools (1.6%)                                                             | 1.6            |                                                                                          |
| Slovak Republic   | 1 609             | 1 596             | Small schools (<4 teachers in ISCED level 2 schools, 0.6%), international schools (0.2%) | 0.8            | -                 | -                 | Small schools (<4 teachers in ISCED level 2 schools, 0.1%), international schools (0.1%) | 0.2            | The teacher exclusion rate is based on the number of teachers in ISCED level 2 schools.  |
| Slovenia          | 456               | 451               | Waldorf schools (0.4%), Italian schools (0.7%)                                           | 1.1            | -                 | -                 | Waldorf schools (0.3%), Italian schools (0.5%)                                           | 0.8            | The teacher exclusion rate is based on the number of ISCED level 2 students.             |
| South Africa      | 8 251             | 8 251             |                                                                                          | 0.0            | -                 | -                 |                                                                                          | 0.0            | The teacher exclusion rate is based on the number of teachers in ISCED level 2 schools.  |
| Spain             | 7 319             | 7 319             |                                                                                          | 0.0            | 250 630           | 250 630           |                                                                                          | 0.0            |                                                                                          |
| Sweden            | 1 754             | 1 754             |                                                                                          | 0.0            | 45 958            | 45 958            |                                                                                          | 0.0            |                                                                                          |

| Country/territory    | Schools           |                   |                                                        |                | Teachers          |                   |                                                        |                | Notes                                                                                                                                                                         |
|----------------------|-------------------|-------------------|--------------------------------------------------------|----------------|-------------------|-------------------|--------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | Target population | Survey population | Exclusions                                             | Exclusion rate | Target population | Survey population | Exclusions                                             | Exclusion rate |                                                                                                                                                                               |
| Türkiye              | 17 149            | 16 672            | Small schools (<4 ISCED level 2 teachers, 2.8%)        | 2.8            | -                 | -                 | Small schools (<4 ISCED level 2 teachers, 0.2%)        | 0.2            | The teacher exclusion rate is based on the number of ISCED level 2 students.                                                                                                  |
| United Arab Emirates | 918               | 897               | Language other than Arabic or English (2.3%)           | 2.3            | 34 962            | 34 437            | Language other than Arabic or English (1.5%)           | 1.5            |                                                                                                                                                                               |
| United States        | 64 590            | 63 988            | Detention centres, hospitals, treatment centres (0.9%) | 0.9            | -                 | -                 | Detention centres, hospitals, treatment centres (0.0%) | 0.0            | The target population comprises the 50 states and Washington, DC, not including the territories. The teacher exclusion rate is based on the number of ISCED level 2 students. |
| Uzbekistan           | 10 585            | 10 585            |                                                        | 0.0            | 344 058           | 344 058           |                                                        | 0.0            |                                                                                                                                                                               |
| Viet Nam             | 11 338            | 11 337            | International school (0.0%)                            | 0.0            | 318 538           | 318 503           | International school (0.0%)                            | 0.0            |                                                                                                                                                                               |

Target and survey populations: ISCED level 1

Figure A C.3. Exclusion rates, ISCED level 1 schools

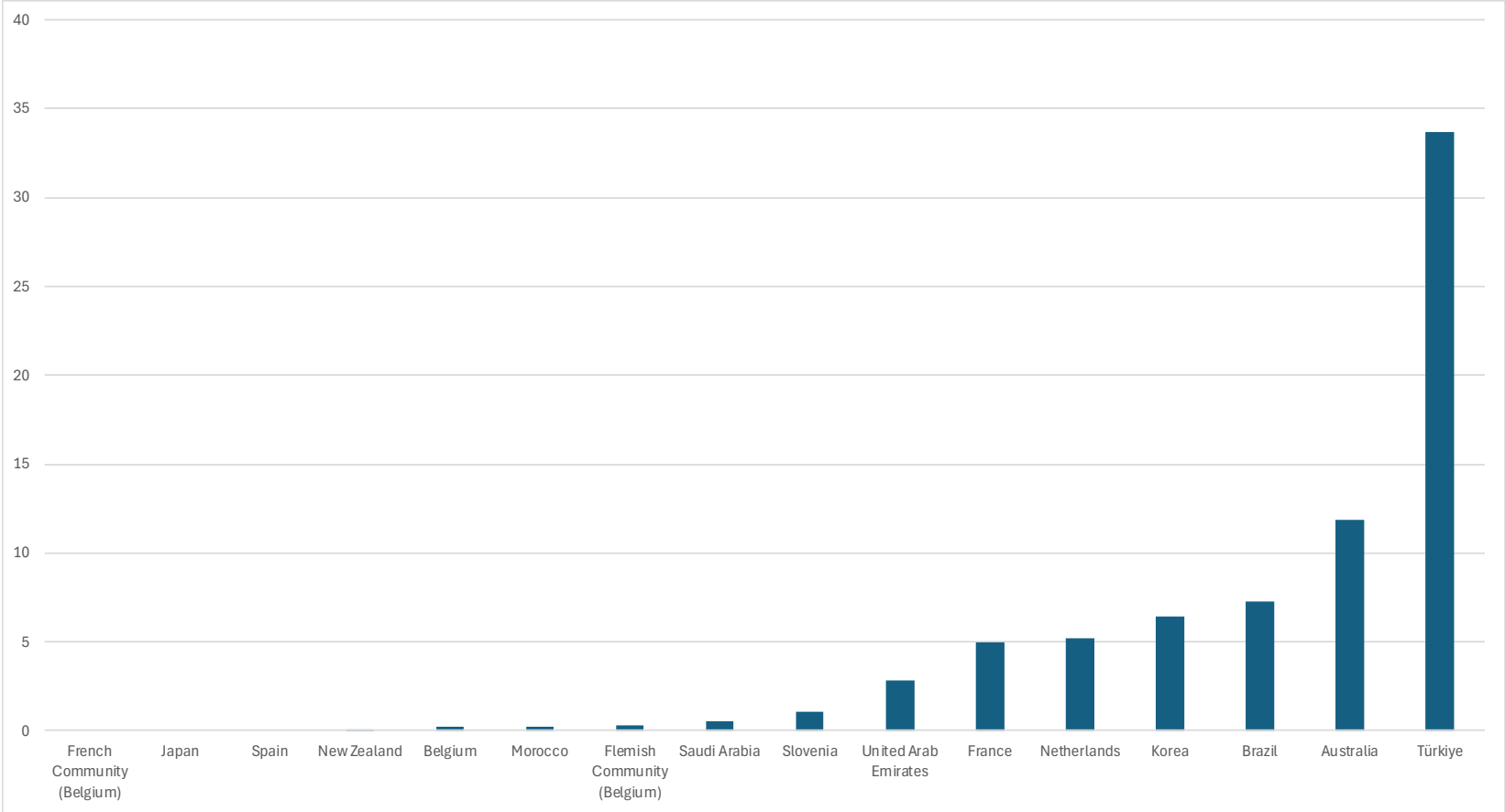


Figure A C.4. Exclusion rates, ISCED level 1 teachers

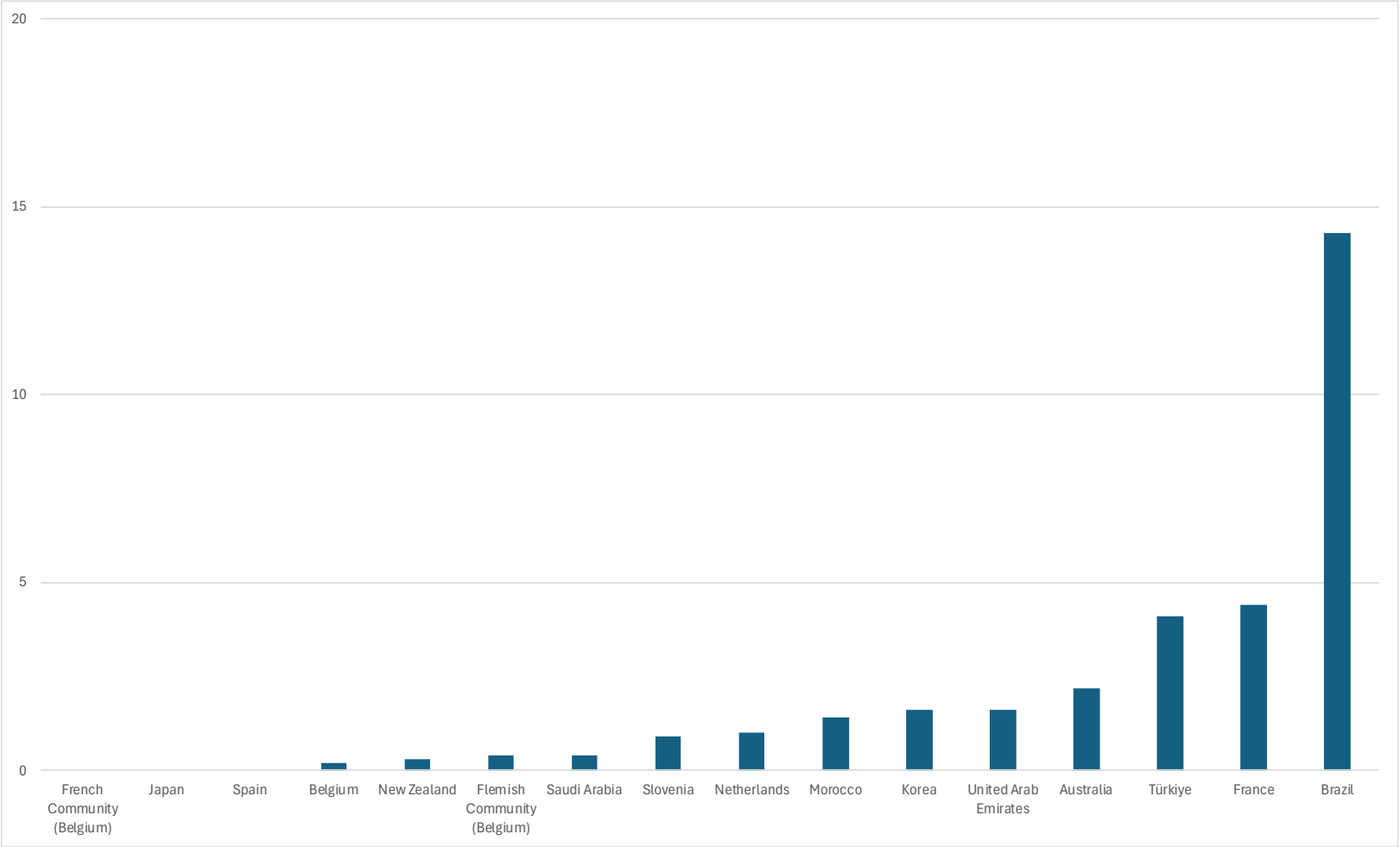




Table A C.2. Target and survey populations: ISCED level 1

| Country/territory           | Schools           |                   |                                                                                                                   |                | Teachers          |                   |                                                                                                                   |                | Notes                                                                                                              |
|-----------------------------|-------------------|-------------------|-------------------------------------------------------------------------------------------------------------------|----------------|-------------------|-------------------|-------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------|
|                             | Target population | Survey population | Exclusions                                                                                                        | Exclusion rate | Target population | Survey population | Exclusions                                                                                                        | Exclusion rate |                                                                                                                    |
| Australia                   | 7 766             | 6 840             | Remote schools (3.0%), small schools (<4 ISCED levels 1 and 2 teachers, 8.9%)                                     | 11.9           | 165 866           | 162 200           | Remote schools (1.1%), small schools (<4 ISCED levels 1 and 2 teachers, 1.1%)                                     | 2.2            | Teacher numbers were estimated by the country.                                                                     |
| Belgium                     | 4 189             | 4 181             | French schools in the Flemish Community (0.2%)                                                                    | 0.2            | 82 019            | 81 846            | French schools in the Flemish Community (0.2%)                                                                    | 0.2            | The target population comprises the Flemish and French Communities of Belgium, not including the German community. |
| Flemish Community (Belgium) | 2 356             | 2 348             | French schools (0.3%)                                                                                             | 0.3            | 45 199            | 45 026            | French schools (0.4%)                                                                                             | 0.4            |                                                                                                                    |
| French Community (Belgium)  | 1 833             | 1 833             |                                                                                                                   | 0.0            | 36 820            | 36 820            |                                                                                                                   | 0.0            |                                                                                                                    |
| Brazil                      | 105 350           | 105 350           | Rio Grande do Sul (within-sample, 7.3%)                                                                           | 7.3            | 895 730           | 895 730           | Rio Grande do Sul (within-sample, 14.3%)                                                                          | 14.3           |                                                                                                                    |
| France                      | 36 571            | 34 742            | Private non-contractual educational sector (2.6%), schools in Réunion, Mayotte and overseas collectivities (2.4%) | 5.0            | -                 | -                 | Private non-contractual educational sector (1.1%), schools in Réunion, Mayotte and overseas collectivities (3.2%) | 4.4            | The teacher exclusion rate is based on the number of teachers in ISCED level 1 schools.                            |
| Japan                       | 19 487            | 19 487            |                                                                                                                   | 0.0            | 411 981           | 411 981           |                                                                                                                   | 0.0            |                                                                                                                    |
| Korea                       | 6 309             | 5 907             | Schools on islands and in remote places (6.4%)                                                                    | 6.4            | 162 085           | 159 484           | Schools on islands and in remote places (1.6%)                                                                    | 1.6            |                                                                                                                    |
| Morocco                     | 24 690            | 24 637            | International schools (0.2%)                                                                                      | 0.2            | 177 674           | 175 166           | International schools (1.4%)                                                                                      | 1.4            |                                                                                                                    |

| Country/territory    | Schools           |                   |                                                                                  |                | Teachers          |                   |                                                                                  |                | Notes                                                                                                                                                                                     |
|----------------------|-------------------|-------------------|----------------------------------------------------------------------------------|----------------|-------------------|-------------------|----------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | Target population | Survey population | Exclusions                                                                       | Exclusion rate | Target population | Survey population | Exclusions                                                                       | Exclusion rate |                                                                                                                                                                                           |
| Netherlands          | 6 225             | 5 903             | Private schools (0.5%), small schools (<41 ISCED levels 02 and 1 students, 4.7%) | 5.2            | -                 | -                 | Private schools (0.1%), small schools (<41 ISCED levels 02 and 1 students, 0.9%) | 1.0            | The target population comprises the European Netherlands, not including the Dutch Caribbean. The teacher exclusion rate is based on the number of ISCED level 1 students.                 |
| New Zealand          | 2 024             | 2 021             | Online-only/correspondence schools (0.1%)                                        | 0.1            | 29 868            | 29 778            | Online-only/correspondence schools (0.3%)                                        | 0.3            | The target population comprises New Zealand, not including the associated states Cook Islands and Niue or the dependent territory Tokelau. Teacher numbers were estimated by the country. |
| Saudi Arabia         | 13 099            | 13 029            | International schools with foreign curriculum (0.5%)                             | 0.5            | 260 491           | 259 510           | International schools with foreign curriculum (0.4%)                             | 0.4            |                                                                                                                                                                                           |
| Slovenia             | 456               | 451               | Waldorf schools (0.4%), Italian schools (0.7%)                                   | 1.1            | -                 | -                 | Waldorf schools (0.3%), Italian schools (0.6%)                                   | 0.9            | The teacher exclusion rate is based on the number of ISCED level 1 students.                                                                                                              |
| Spain                | 13 648            | 13 648            |                                                                                  | 0.0            | 233 871           | 233 871           |                                                                                  | 0.0            |                                                                                                                                                                                           |
| Türkiye              | 24 648            | 16 344            | Small schools (<4 ISCED level 1 teachers, 33.7%)                                 | 33.7           | -                 | -                 | Small schools (<4 ISCED level 1 teachers, 4.1%)                                  | 4.1            | The teacher exclusion rate is based on the number of ISCED level 1 students.                                                                                                              |
| United Arab Emirates | 828               | 805               | Language other than Arabic or English (2.8%)                                     | 2.8            | 38 069            | 37 457            | Language other than Arabic or English (1.6%)                                     | 1.6            |                                                                                                                                                                                           |

Target and survey populations: ISCED level 3

Figure A C.5. Exclusion rates, ISCED level 3 schools

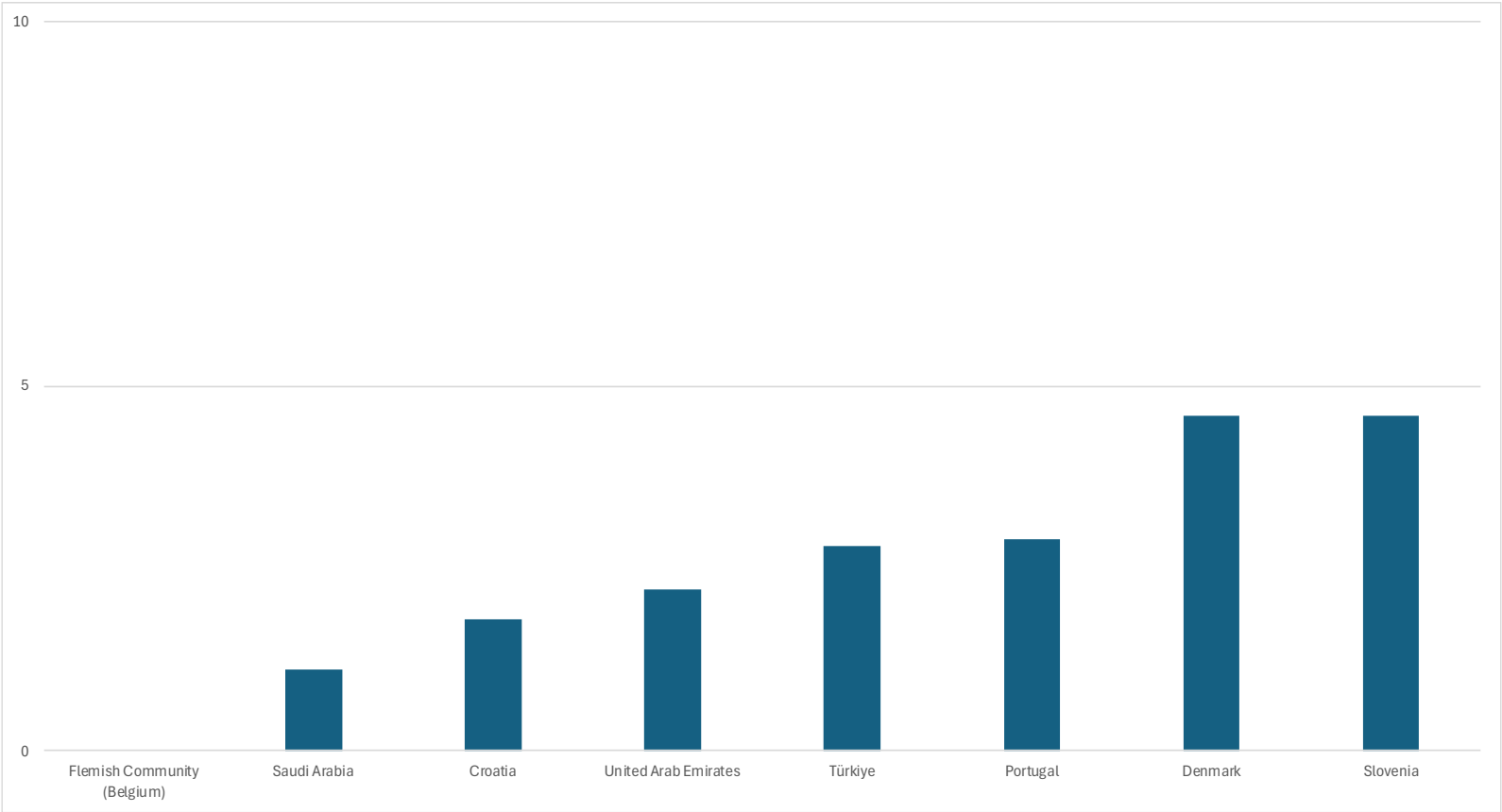


Figure A C.6. Exclusion rates, ISCED level 3 teachers

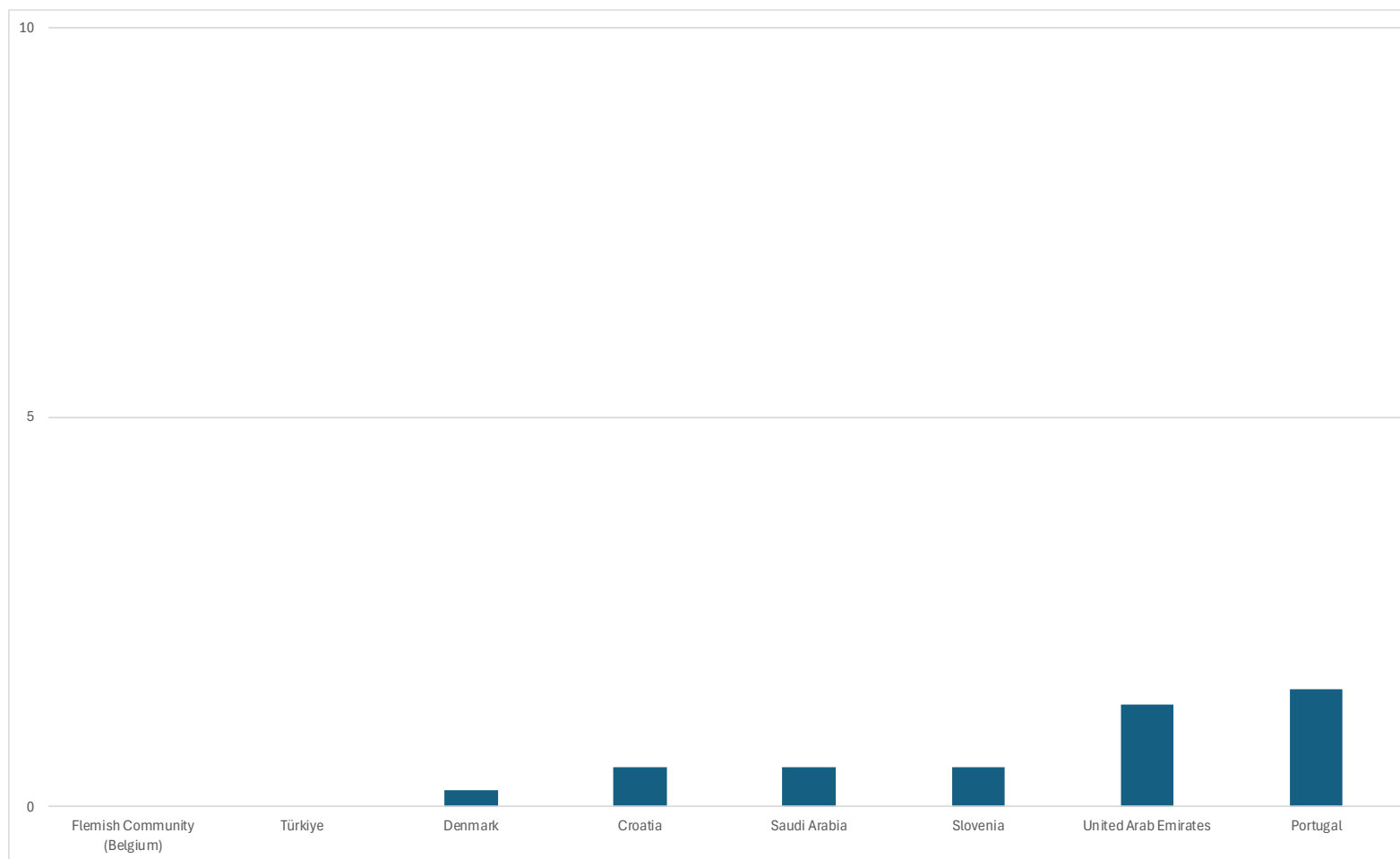


Table A C.3. Target and survey populations: ISCED level 3

| Country/territory           | Teachers          |                   |                                                                                                     |                | Schools           |                   |                                                                                                     |                | Notes                                                                                                                                                                                                              |
|-----------------------------|-------------------|-------------------|-----------------------------------------------------------------------------------------------------|----------------|-------------------|-------------------|-----------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | Target population | Survey population | Exclusions                                                                                          | Exclusion rate | Target population | Survey population | Exclusions                                                                                          | Exclusion rate |                                                                                                                                                                                                                    |
| Croatia                     | 385               | 378               | Italian schools (1.0%), Hungarian school (0.3%), Serbian school (0.3%), international school (0.3%) | 1.8            | -                 | -                 | Italian schools (0.4%), Hungarian school (0.0%), Serbian school (0.0%), international school (0.0%) | 0.5            | The teacher exclusion rate is based on the number of ISCED level 3 students.                                                                                                                                       |
| Denmark                     | 636               | 607               | Small schools (<15 ISCED level 3 students, 3.8%), international schools (0.8%)                      | 4.6            | -                 | -                 | Small schools (<15 ISCED level 3 students, 0.1%), international schools (0.2%)                      | 0.2            | The target population comprises metropolitan Denmark, not including the autonomous territories of the Faroe Islands and Greenland.<br>The teacher exclusion rate is based on the number of ISCED level 3 students. |
| Flemish Community (Belgium) | 705               | 705               |                                                                                                     | 0.0            | 61 095            | 61 095            |                                                                                                     | 0.0            |                                                                                                                                                                                                                    |
| Portugal                    | 789               | 766               | Schools with a non-Portuguese curriculum (2.9%)                                                     | 2.9            | 40 245            | 39 632            | Schools with a non-Portuguese curriculum (1.5%)                                                     | 1.5            | The target population comprises mainland Portugal, not including the Azores and Madeira.                                                                                                                           |
| Saudi Arabia                | 5 272             | 5 216             | International schools with a foreign curriculum (1.1%)                                              | 1.1            | 117 760           | 117 176           | International schools with a foreign curriculum (0.5%)                                              | 0.5            |                                                                                                                                                                                                                    |
| Slovenia                    | 151               | 144               | Waldorf school (0.7%), Italian schools (2.0%), institutions for delinquent students (2.0%)          | 4.6            | -                 | -                 | Waldorf school (0.2%), Italian schools (0.2%), institutions for delinquent students (0.1%)          | 0.5            | The teacher exclusion rate is based on the number of ISCED level 3 students.                                                                                                                                       |
| Türkiye                     | 11 257            | 10 941            | Small schools (<4 ISCED level 3 teachers, 2.8%)                                                     | 2.8            | -                 | -                 | Small schools (<4 ISCED level 3 teachers, 0.0%)                                                     | 0.0            | The exclusion rate is based on the number of ISCED level 3 students.                                                                                                                                               |
| United Arab Emirates        | 668               | 653               | Language other than Arabic or English (2.2%)                                                        | 2.2            | 26 974            | 26 631            | Language other than Arabic or English (1.3%)                                                        | 1.3            |                                                                                                                                                                                                                    |

## Target and survey populations: ISCED level 02

Figure A C.7. Exclusion rates, ISCED level 02 settings

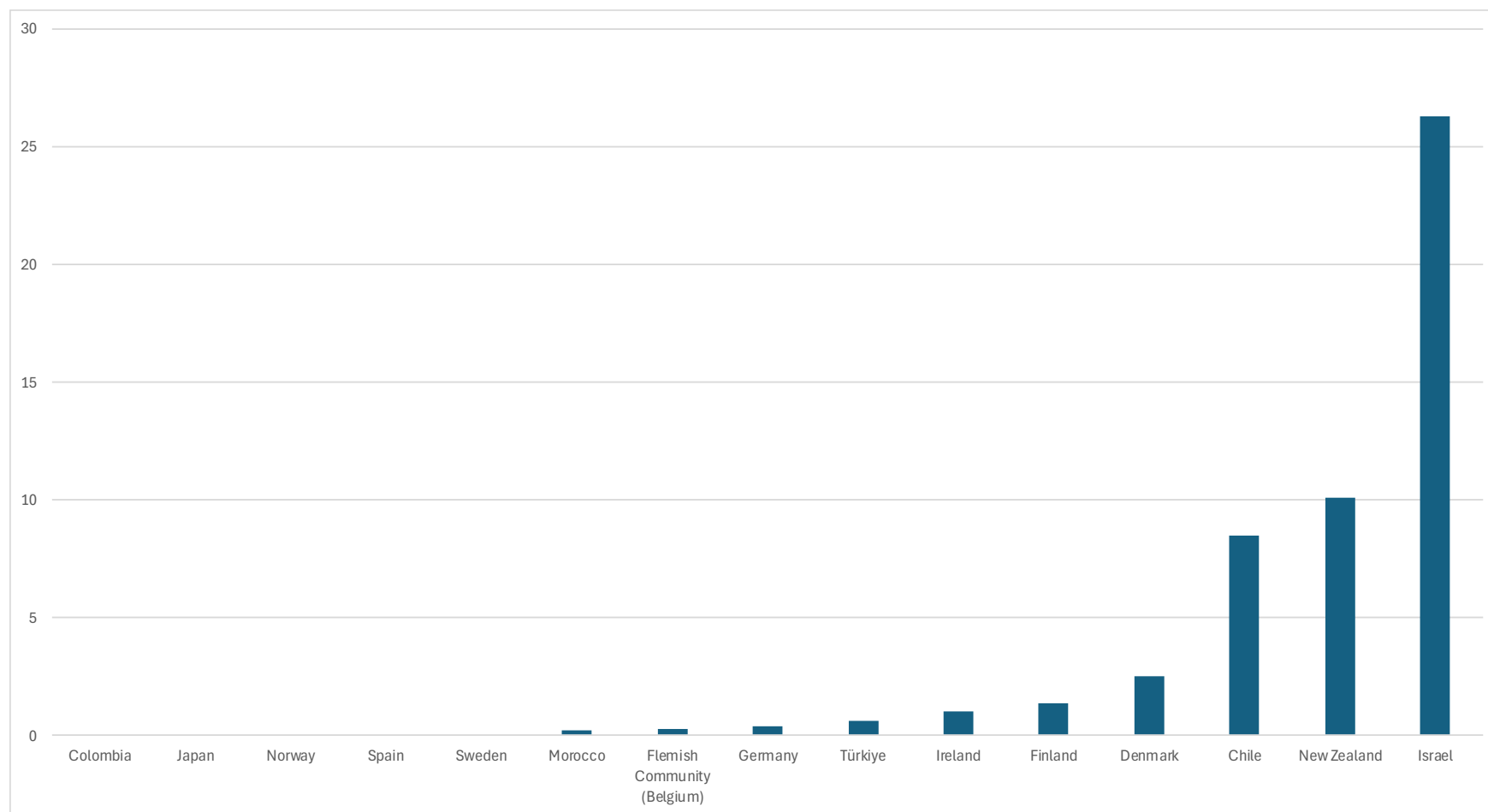


Figure A C.8. Exclusion rates, ISCED level 02 staff

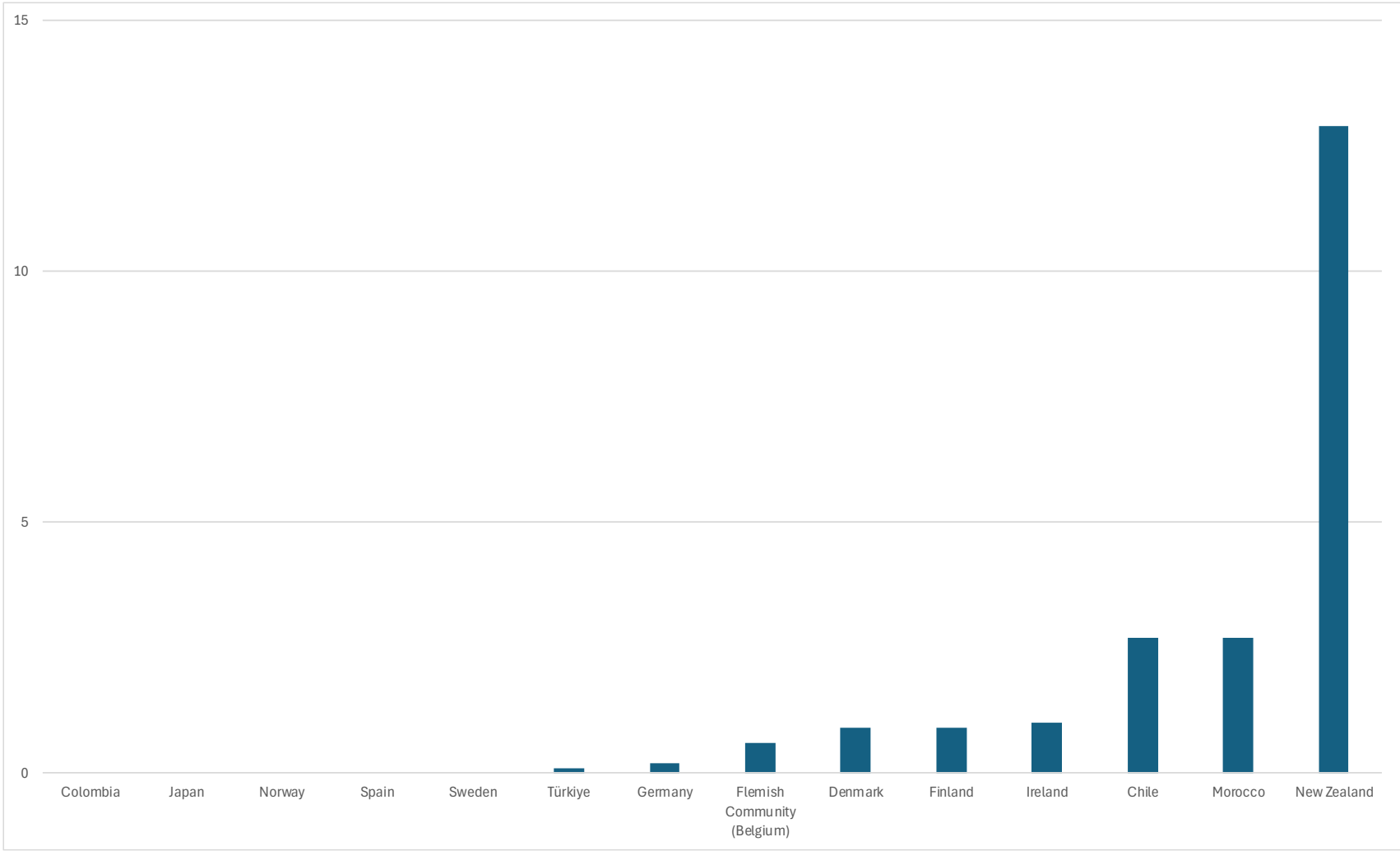


Table A C.4. Target and survey populations: ISCED level 02

| Country/territory           | Settings          |                   |                                                                                                                                                                             |                | Staff             |                   |                                                                                                                                                                             |                | Notes                                                                                                                                                                              |
|-----------------------------|-------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | Target population | Survey population | Exclusions                                                                                                                                                                  | Exclusion rate | Target population | Survey population | Exclusions                                                                                                                                                                  | Exclusion rate |                                                                                                                                                                                    |
| Chile                       | 9 912             | 9 155             | Insular Chile and Cabo de Hornos (0.1%), small settings (<2 members of staff, 1.9%), settings with only assistants (5.7%), settings in conflict zones (within-sample, 0.9%) | 8.5            | -                 | -                 | Insular Chile and Cabo de Hornos (0.1%), small settings (<2 members of staff, 0.2%), settings with only assistants (1.1%), settings in conflict zones (within-sample, 1.3%) | 2.7            | The staff exclusion rate is based on the number of staff in ISCED level 02 settings.                                                                                               |
| Colombia                    | 78 751            | 78 751            |                                                                                                                                                                             | 0.0            | -                 | -                 |                                                                                                                                                                             | 0.0            | The staff exclusion rate is based on the number of ISCED level 02 children.                                                                                                        |
| Denmark                     | 3 536             | 3 448             | Small settings (<15 ISCED level 02 children, 2.5%)                                                                                                                          | 2.5            | 36 167            | 35 839            | Small settings (<15 ISCED level 02 children, 0.9%)                                                                                                                          | 0.9            | The target population comprises metropolitan Denmark, not including the autonomous territories of the Faroe Islands and Greenland.<br>Staff numbers were estimated by the country. |
| Finland                     | 4 973             | 4 901             | Åland (0.8%), language other than Finnish or Swedish (0.6%)                                                                                                                 | 1.4            | -                 | -                 | Åland (0.5%), language other than Finnish or Swedish (0.4%)                                                                                                                 | 0.9            | The staff exclusion rate is based on the number of ISCED level 02 children.                                                                                                        |
| Flemish Community (Belgium) | 2 360             | 2 352             | French settings (0.3%)                                                                                                                                                      | 0.3            | 24 741            | 24 650            | French settings (0.4%), leaders with staff duties (within-sample, 0.2%)                                                                                                     | 0.6            |                                                                                                                                                                                    |
| Germany                     | 54 362            | 54 133            | Pre-classes (Vorklassen, 0.4%)                                                                                                                                              | 0.4            | -                 | -                 | Pre-classes (Vorklassen, 0.2%)                                                                                                                                              | 0.2            | The staff exclusion rate was estimated by the country.                                                                                                                             |



| Country/territory | Settings          |                   |                                                                                                                      |                | Staff             |                   |                                                                                                                      |                | Notes                                                                                                                                                                                                                              |
|-------------------|-------------------|-------------------|----------------------------------------------------------------------------------------------------------------------|----------------|-------------------|-------------------|----------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | Target population | Survey population | Exclusions                                                                                                           | Exclusion rate | Target population | Survey population | Exclusions                                                                                                           | Exclusion rate |                                                                                                                                                                                                                                    |
| Ireland           | 3 974             | 3 934             | Early start/early intervention programmes (1.0%)                                                                     | 1.0            | -                 | -                 | Early start/early intervention programmes (1.0%)                                                                     | 1.0            | The staff exclusion rate is based on the number of places in ISCED level 02 settings.                                                                                                                                              |
| Israel            | 17 198            | 12 681            | Ultra-Orthodox settings (26.3%)                                                                                      | 26.3           | -                 | -                 | Ultra-Orthodox settings                                                                                              | -              | The staff exclusion rate is unknown.                                                                                                                                                                                               |
| Japan             | 37 128            | 37 128            |                                                                                                                      | 0.0            | 326 282           | 326 282           |                                                                                                                      | 0.0            |                                                                                                                                                                                                                                    |
| Morocco           | 25 180            | 25 127            | International settings (0.2%)                                                                                        | 0.2            | 30 867            | 30 028            | International settings (2.7%)                                                                                        | 2.7            |                                                                                                                                                                                                                                    |
| New Zealand       | 4 150             | 3 731             | Correspondence school (0.0%), Te Kōhanga Reo (Māori language immersion environment for children and families, 10.1%) | 10.1           | -                 | -                 | Correspondence school (0.0%), Te Kōhanga Reo (Māori language immersion environment for children and families, 12.8%) | 12.9           | The target population comprises New Zealand, not including the associated states Cook Islands and Niue or the dependent territory Tokelau.<br>The staff exclusion rate is based on the number of staff in ISCED level 02 settings. |
| Norway            | 4 976             | 4 976             |                                                                                                                      | 0.0            | -                 | -                 |                                                                                                                      | 0.0            | The staff exclusion rate is based on the number of staff in ISCED level 02 settings.                                                                                                                                               |
| Spain             | 13 830            | 13 830            |                                                                                                                      | 0.0            | 137 396           | 137 396           |                                                                                                                      | 0.0            |                                                                                                                                                                                                                                    |
| Sweden            | 13 011            | 13 011            |                                                                                                                      | 0.0            | -                 | -                 |                                                                                                                      | 0.0            | The staff exclusion rate is based on the number of staff in ISCED level 02 settings.                                                                                                                                               |
| Türkiye           | 24 621            | 24 471            | Small schools (with unknown number of staff, 0.6%)                                                                   | 0.6            | -                 | -                 | Small schools (with unknown number of staff, 0.1%), leaders with staff duties (within-sample, 0.0%)                  | 0.1            | The staff exclusion rate is based on the number of ISCED level 02 children.                                                                                                                                                        |

## Target and survey populations: children under the age of three (U3)

Figure A C.9. Exclusion rates, U3 settings

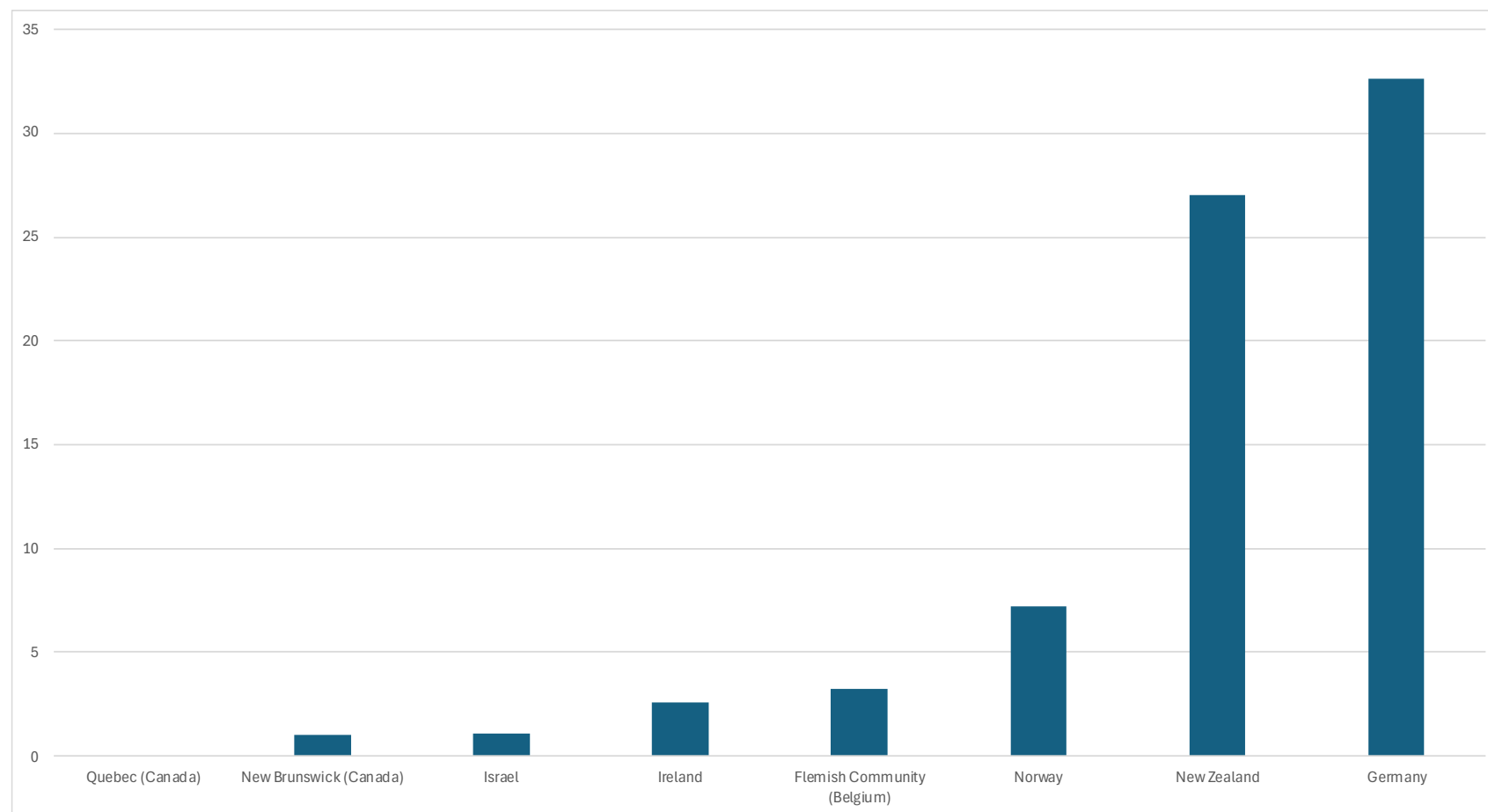


Figure A C.10. Exclusion rates, U3 staff

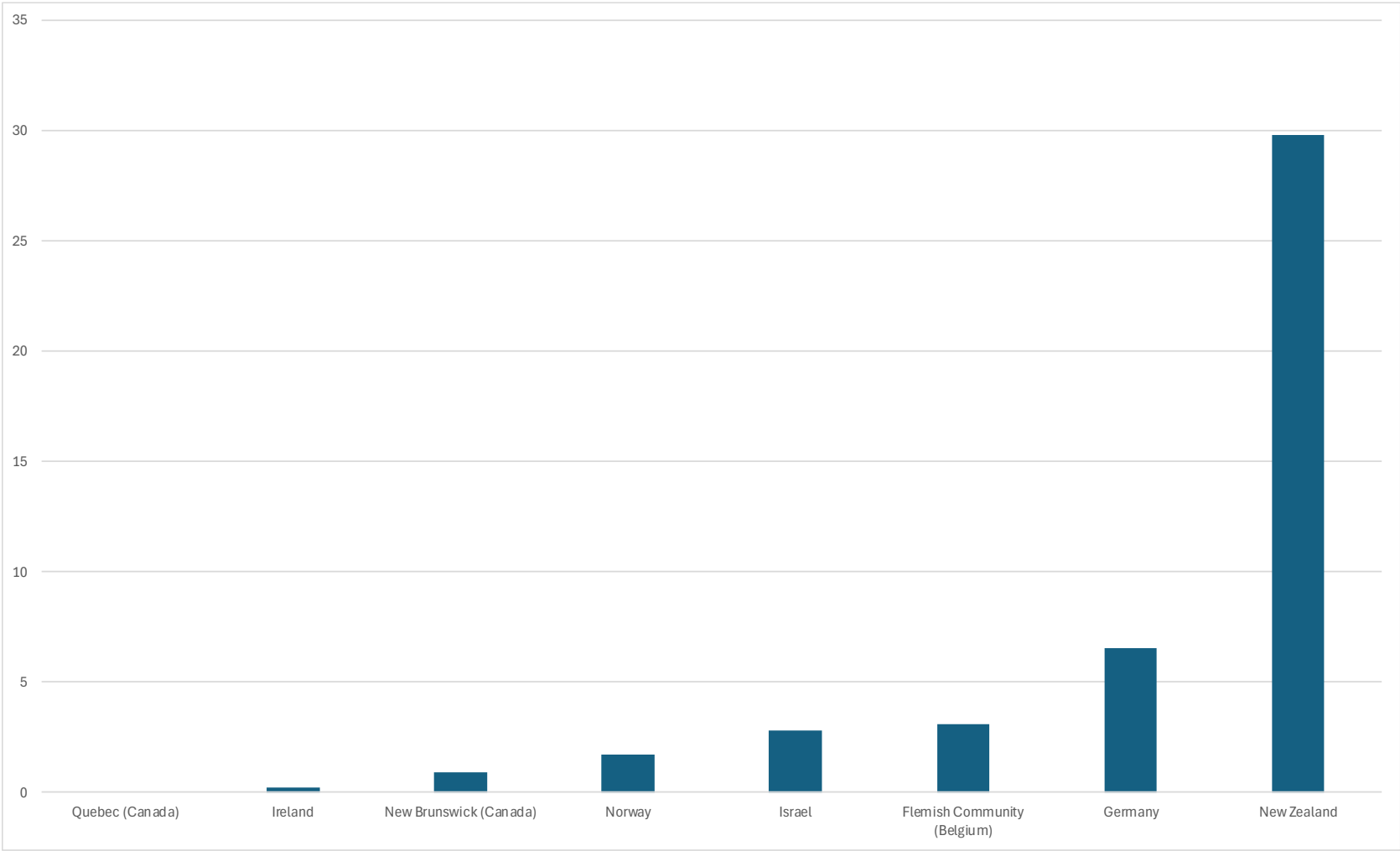


Table A C.5. Target and survey populations: U3

| Country/territory           | Settings          |                   |                                                                                                                                       |                | Staff             |                   |                                                                                                                                        |                | Notes                                                                                                                                                                                                                  |
|-----------------------------|-------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | Target population | Survey population | Exclusions                                                                                                                            | Exclusion rate | Target population | Survey population | Exclusions                                                                                                                             | Exclusion rate |                                                                                                                                                                                                                        |
| Flemish Community (Belgium) | 5 912             | 5 724             | Settings without subsidy (3.2%)                                                                                                       | 3.2            | -                 | -                 | Settings without subsidy                                                                                                               | 3.1            | The staff exclusion rate is based on the number of U3 places.                                                                                                                                                          |
| Germany                     | 84 220            | 56 744            | Home-based settings (32.6%)                                                                                                           | 32.6           | -                 | -                 | Home-based settings                                                                                                                    | 6.5            | The staff exclusion rate was estimated by the country.                                                                                                                                                                 |
| Ireland                     | 2 207             | 2 150             | Childminders (2.6%)                                                                                                                   | 2.6            | -                 | -                 | Childminders                                                                                                                           | 0.2            | The staff exclusion rate is based on the number of places in U3 settings.                                                                                                                                              |
| Israel                      | 6 579             | 6 579             | Language other than Hebrew or Arabic (within-sample, 1.1%)                                                                            | 1.1            | -                 | -                 | Language other than Hebrew or Arabic (within-sample)                                                                                   | 2.8            |                                                                                                                                                                                                                        |
| New Brunswick (Canada)      | 573               | 567               | First Nations Reserves (1.0%)                                                                                                         | 1.0            | -                 | -                 | First Nations Reserves                                                                                                                 | 0.9            | The staff exclusion rate is based on the number of children in U3 settings.                                                                                                                                            |
| New Zealand                 | 3 701             | 2 702             | Free kindergartens (5.8%), playcentres (9.9%), Te Kōhanga Reo (Māori language immersion environment for children and families, 11.2%) | 27.0           | -                 | -                 | Free kindergartens (3.1%), playcentres (13.8%), Te Kōhanga Reo (Māori language immersion environment for children and families, 12.9%) | 29.8           | The target population comprises New Zealand, not including the associated states Cook Islands and Niue or the dependent territory Tokelau.<br>The staff exclusion rate is based on the number of staff in U3 settings. |
| Norway                      | 5 339             | 4 953             | Home-based settings (7.2%)                                                                                                            | 7.2            | -                 | -                 | Home-based settings (1.7%)                                                                                                             | 1.7            | The staff exclusion rate is based on the number of staff in U3 settings.                                                                                                                                               |
| Quebec (Canada)             | 13 843            | 13 843            |                                                                                                                                       | 0.0            | -                 | -                 |                                                                                                                                        | 0.0            | The staff exclusion rate is based on the number of children in U3 settings.                                                                                                                                            |

## Annex D. Characteristics of national samples

This annex contains the characteristics of national samples, ordered by module and country/territory. The features of the sample design, including the sample allocations, sample sizes, methods of sample selection, measures of size, explicit and implicit stratification schemes, are presented as determined prior to the school/setting sample selections. The source of the school/setting frame is stated, as indicated by the country/territory.

The tables show the achieved sample sizes, detailing the status of sampled schools/settings. Per country/territory, there is one table for the principal/leader population and two tables for the teacher/staff population, indicating the participation on the school/setting level and on the teacher/staff level.

Information on participation in the Teacher Knowledge Survey (TKS) module is added to the respective International Standard Classification of Education (ISCED) level 2 samples. As the same school samples were used, the same sample design applies.

## Characteristics of national samples, ISCED level 2 and TK5

### Albania: ISCED level 2

ISCED level 2 in Albania consists of “Lower secondary or second stage of basic education” and comprises Grades 1 to 4 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 30 schools were selected for the field trial; 286 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by funding with two categories (public, private), urbanisation with two categories (urban, rural) and region with four categories (Dürres, Fier, Korçë and Lezhë) within public schools.

*Implicit stratification:* Organised by urbanisation with two categories (urban, rural).

*Data sources:* Data used for school sampling were obtained from the General Directorate of Pre-University Education (Ministry of Education and Sports) and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Albania, ISCED level 2**

| Explicit stratum        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Rural – Dürres | 46                    | 0                  | 0                | 46                            | 0                                | 0                                 | 0                         |
| Public – Rural – Fier   | 28                    | 1                  | 0                | 27                            | 0                                | 0                                 | 0                         |
| Public – Rural – Korçë  | 38                    | 1                  | 0                | 37                            | 0                                | 0                                 | 0                         |
| Public – Urban – Lezhë  | 18                    | 0                  | 0                | 18                            | 0                                | 0                                 | 0                         |
| Public – Urban – Dürres | 54                    | 0                  | 0                | 54                            | 0                                | 0                                 | 0                         |
| Public – Urban – Fier   | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Public – Urban – Korçë  | 26                    | 0                  | 0                | 26                            | 0                                | 0                                 | 0                         |
| Public – Urban – Lezhë  | 18                    | 0                  | 0                | 18                            | 0                                | 0                                 | 0                         |
| Private                 | 30                    | 1                  | 0                | 28                            | 0                                | 1                                 | 0                         |
| <b>Total</b>            | <b>286</b>            | <b>4</b>           | <b>0</b>         | <b>281</b>                    | <b>0</b>                         | <b>1</b>                          | <b>0</b>                  |

**Table A D.2. School participation status: survey of teachers – Albania, ISCED level 2**

| Explicit stratum        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Rural – Dürres | 46                    | 0                  | 0                | 46                            | 0                                | 0                                 | 0                         |
| Public – Rural – Fier   | 28                    | 1                  | 0                | 27                            | 0                                | 0                                 | 0                         |
| Public – Rural – Korçë  | 38                    | 1                  | 0                | 37                            | 0                                | 0                                 | 0                         |
| Public – Rural – Lezhë  | 24                    | 1                  | 0                | 23                            | 0                                | 0                                 | 0                         |
| Public – Urban – Dürres | 54                    | 0                  | 0                | 54                            | 0                                | 0                                 | 0                         |
| Public – Urban – Fier   | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Public – Urban – Korçë  | 26                    | 0                  | 0                | 26                            | 0                                | 0                                 | 0                         |
| Public – Urban – Lezhë  | 18                    | 0                  | 0                | 18                            | 0                                | 0                                 | 0                         |
| Private                 | 30                    | 1                  | 0                | 28                            | 0                                | 1                                 | 0                         |
| <b>Total</b>            | <b>286</b>            | <b>4</b>           | <b>0</b>         | <b>281</b>                    | <b>0</b>                         | <b>1</b>                          | <b>0</b>                  |

Table A D.3. Teacher participation status – Albania, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 029        |
| Absent                  | 23           |
| Left school permanently | 5            |
| Not part of sample      | 0            |
| <b>Total</b>            | <b>4 057</b> |

### Alberta (Canada): ISCED level 2

ISCED level 2 in Canada consists of “Junior high/middle school” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 students for anglophone schools; census for francophone schools.

*Sample sizes:* 30 schools were selected for the field trial; 285 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by language with two categories (anglophone, francophone) and funding with two categories (public, private) for anglophone schools.

*Implicit stratification:* Organised by school type with five categories (public, separate, charter, private, francophone).

*Data sources:* Data used for school sampling were obtained from the Alberta Education Corporate Data Warehouse and referred to school year 2021/22.

**Table A D.4. School participation status: survey of principals – Alberta (Canada), ISCED level 2**

| Explicit stratum     | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Anglophone – Public  | 244                   | 6                  | 0                | 108                           | 12                               | 3                                 | 115                       |
| Anglophone – Private | 14                    | 0                  | 0                | 2                             | 1                                | 3                                 | 8                         |
| Francophone – Public | 27                    | 0                  | 0                | 10                            | 0                                | 0                                 | 17                        |
| <b>Total</b>         | <b>285</b>            | <b>6</b>           | <b>0</b>         | <b>120</b>                    | <b>13</b>                        | <b>6</b>                          | <b>140</b>                |

**Table A D.5. School participation status: survey of teachers – Alberta (Canada), ISCED level 2**

| Explicit stratum     | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Anglophone – Public  | 244                   | 6                  | 0                | 123                           | 13                               | 3                                 | 99                        |
| Anglophone – Private | 14                    | 0                  | 0                | 2                             | 2                                | 2                                 | 8                         |
| Francophone – Public | 27                    | 0                  | 0                | 8                             | 0                                | 0                                 | 19                        |
| <b>Total</b>         | <b>285</b>            | <b>6</b>           | <b>0</b>         | <b>133</b>                    | <b>15</b>                        | <b>5</b>                          | <b>126</b>                |

**Table A D.6. Teacher participation status – Alberta (Canada), ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 823        |
| Absent                  | 415          |
| Left school permanently | 11           |
| Not part of sample      | 14           |
| <b>Total</b>            | <b>2 263</b> |



### Australia: ISCED level 2

ISCED level 2 in Australia consists of “Secondary school”, “Certificate I” and “Certificate II” and comprises Grades 8 to 11 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 31 schools were selected for the field trial; 204 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 2 only, ISCED levels 1 and 2) and sector with three categories (government, independent, Catholic).

*Implicit stratification:* Organised by socio-economic status with three categories (low, medium, high).

*Data sources:* Data used for school sampling were obtained from the Australian Council for Educational Research and referred to 2022.

**Table A D.7. School participation status: survey of principals – Australia, ISCED level 2**

| Explicit stratum                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Government         | 104                   | 0                  | 0                | 58                            | 16                               | 11                                | 19                        |
| ISCED 2 only – Independent        | 8                     | 0                  | 0                | 7                             | 1                                | 0                                 | 0                         |
| ISCED 2 only – Catholic           | 36                    | 0                  | 0                | 32                            | 3                                | 0                                 | 1                         |
| ISCED 1 and ISCED 2 – Government  | 12                    | 0                  | 0                | 5                             | 4                                | 2                                 | 1                         |
| ISCED 1 and ISCED 2 – Independent | 36                    | 0                  | 0                | 26                            | 8                                | 0                                 | 2                         |
| ISCED 1 and ISCED 2 – Catholic    | 8                     | 0                  | 0                | 5                             | 2                                | 1                                 | 0                         |
| <b>Total</b>                      | <b>204</b>            | <b>0</b>           | <b>0</b>         | <b>133</b>                    | <b>34</b>                        | <b>14</b>                         | <b>23</b>                 |

**Table A D.8. School participation status: survey of teachers – Australia, ISCED level 2**

| Explicit stratum                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Government         | 104                   | 0                  | 0                | 58                            | 15                               | 11                                | 20                        |
| ISCED 2 only – Independent        | 8                     | 0                  | 0                | 7                             | 1                                | 0                                 | 0                         |
| ISCED 2 only – Catholic           | 36                    | 0                  | 0                | 32                            | 3                                | 0                                 | 1                         |
| ISCED 1 and ISCED 2 – Government  | 12                    | 0                  | 0                | 5                             | 3                                | 2                                 | 2                         |
| ISCED 1 and ISCED 2 – Independent | 36                    | 0                  | 0                | 26                            | 8                                | 0                                 | 2                         |
| ISCED 1 and ISCED 2 – Catholic    | 8                     | 0                  | 0                | 5                             | 2                                | 1                                 | 0                         |
| <b>Total</b>                      | <b>204</b>            | <b>0</b>           | <b>0</b>         | <b>133</b>                    | <b>32</b>                        | <b>14</b>                         | <b>25</b>                 |

**Table A D.9. Teacher participation status – Australia, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 035        |
| Absent                  | 453          |
| Left school permanently | 23           |
| Not part of sample      | 59           |
| <b>Total</b>            | <b>3 570</b> |

### Austria: ISCED level 2

ISCED level 2 in Austria consists of “Primary school, stages 5-8”, “Academic secondary school, junior stage”, “General school of own statutory right (including international schools), stages 5-8” and “New secondary school” and comprises Grades 5 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between academic secondary schools and compulsory education schools.

*Sample sizes:* 34 schools were selected for the field trial; 280 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by school type with three categories (academic secondary schools, compulsory education schools, schools by statute).

*Implicit stratification:* Organised by urbanisation with two categories (dense, medium and sparse) for academic secondary schools, urbanisation with three categories (dense, medium, sparse) for compulsory education schools and states with nine categories (Burgenland, Carinthia, Lower Austria, Salzburg, Styria, Tyrol, Upper Austria, Vienna, Vorarlberg).

*Data sources:* Data used for school sampling were obtained from the Federal Ministry of Education, Science and Research and referred to school years 2019/20 and 2020/21.

**Table A D.10. School participation status: survey of principals – Austria, ISCED level 2**

| Explicit stratum                    | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Academic secondary schools (AHS)    | 110                   | 0                  | 0                | 97                            | 9                                | 0                                 | 4                         |
| Compulsory education schools (APS)  | 160                   | 2                  | 0                | 131                           | 18                               | 6                                 | 3                         |
| Schools by statute (Statutsschulen) | 10                    | 0                  | 3                | 2                             | 1                                | 2                                 | 2                         |
| <b>Total</b>                        | <b>280</b>            | <b>2</b>           | <b>3</b>         | <b>230</b>                    | <b>28</b>                        | <b>8</b>                          | <b>9</b>                  |

**Table A D.11. School participation status: survey of teachers – Austria, ISCED level 2**

| Explicit stratum                    | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Academic secondary schools (AHS)    | 110                   | 0                  | 0                | 95                            | 9                                | 0                                 | 6                         |
| Compulsory education schools (APS)  | 160                   | 2                  | 0                | 116                           | 16                               | 6                                 | 20                        |
| Schools by statute (Statutsschulen) | 10                    | 0                  | 3                | 2                             | 1                                | 2                                 | 2                         |
| <b>Total</b>                        | <b>280</b>            | <b>2</b>           | <b>3</b>         | <b>213</b>                    | <b>26</b>                        | <b>8</b>                          | <b>28</b>                 |

**Table A D.12. Teacher participation status – Austria, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 335        |
| Absent                  | 711          |
| Left school permanently | 30           |
| Not part of sample      | 26           |
| <b>Total</b>            | <b>5 102</b> |

### Azerbaijan: ISCED level 2

ISCED level 2 in Azerbaijan consists of “General secondary education” and comprises Grades 5 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

The target population does not include schools or teachers in the Karabakh Economic Zone under Russian peacekeeping control.

*Sample allocation:* Disproportional allocation to allow comparisons between public and private schools; adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 30 schools were selected for the field trial; 223 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by funding with two categories (public, private) and language with three categories (Azerbaijani, Azerbaijani and Russian, Russian) within public schools.

*Implicit stratification:* Organised by urbanisation with two categories (urban, rural).

*Data sources:* Data used for school sampling were obtained from the Ministry of Science and Education and referred to school year 2021/22.

**Table A D.13. School participation status: survey of principals – Azerbaijan, ISCED level 2**

| Explicit stratum                 | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Azerbaijani             | 158                   | 0                  | 0                | 158                           | 0                                | 0                                 | 0                         |
| Public – Azerbaijani and Russian | 38                    | 0                  | 0                | 37                            | 1                                | 0                                 | 0                         |
| Public – Russian                 | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Private                          | 19                    | 0                  | 0                | 18                            | 0                                | 0                                 | 1                         |
| <b>Total</b>                     | <b>223</b>            | <b>0</b>           | <b>0</b>         | <b>221</b>                    | <b>1</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.14. School participation status: survey of teachers – Azerbaijan, ISCED level 2**

| Explicit stratum                 | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Azerbaijani             | 158                   | 0                  | 0                | 158                           | 0                                | 0                                 | 0                         |
| Public – Azerbaijani and Russian | 38                    | 0                  | 0                | 37                            | 1                                | 0                                 | 0                         |
| Public – Russian                 | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Private                          | 19                    | 0                  | 0                | 18                            | 0                                | 0                                 | 1                         |
| <b>Total</b>                     | <b>223</b>            | <b>0</b>           | <b>0</b>         | <b>221</b>                    | <b>1</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.15. Teacher participation status – Azerbaijan, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 307        |
| Absent                  | 67           |
| Left school permanently | 13           |
| Not part of sample      | 4            |
| <b>Total</b>            | <b>4 391</b> |

### Bahrain: ISCED level 2

ISCED level 2 in Bahrain consists of “General preparatory education” and “Religious preparatory education” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Census.

*Sample sizes:* 30 schools were selected for the field trial; all 122 schools were asked to participate in the main survey.

*Method of sample selection:* Census.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by funding with two categories (public, private).

*Implicit stratification:* Organised by governorate with four categories (Capital, Muharraq, Northern, Southern).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2021/22.

**Table A D.16. School participation status: survey of principals – Bahrain, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public           | 62                    | 0                  | 0                | 62                            | 0                                | 0                                 | 0                         |
| Private          | 60                    | 6                  | 0                | 53                            | 0                                | 0                                 | 1                         |
| <b>Total</b>     | <b>122</b>            | <b>6</b>           | <b>0</b>         | <b>115</b>                    | <b>0</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.17. School participation status: survey of teachers – Bahrain, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public           | 62                    | 0                  | 0                | 62                            | 0                                | 0                                 | 0                         |
| Private          | 60                    | 6                  | 0                | 54                            | 0                                | 0                                 | 0                         |
| <b>Total</b>     | <b>122</b>            | <b>6</b>           | <b>0</b>         | <b>116</b>                    | <b>0</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.18. Teacher participation status – Bahrain, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 104        |
| Absent                  | 74           |
| Left school permanently | 108          |
| Not part of sample      | 31           |
| <b>Total</b>            | <b>3 317</b> |

### Belgium: ISCED level 2

The target population comprises the Flemish and French Communities of Belgium, not including the German Community.

ISCED level 2 in the Flemish Community of Belgium consists of “Reception class for immigrants”, “Regular secondary education – 1<sup>st</sup> stage” and “European School – 1<sup>st</sup> stage” and comprises Grades 7 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

ISCED level 2 in the French Community of Belgium consists of “Regular secondary education – common first stage” and “Regular secondary education – differentiated first stage” and comprises Grades 7 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to accommodate separate adjudication of communities.

*Sample sizes:* 30 schools were selected for the field trial; 360 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools for the Flemish Community and number of ISCED level 2 students in schools for French Community.

*Explicit stratification:* Organised by community with two categories (Flemish, French), by funding with three categories (public at the state level, public at the local level, private) within the French Community, by overlap with two categories (ISCED level 2 only, ISCED levels 2 and 3) and funding with two categories (public, private) within the Flemish Community.

*Implicit stratification:* Organised by educational network with three categories (education organised by the Flemish Community, government-aided public education, government-aided private education) within the Flemish Community and by ISCED level 3 tracks with four categories (ISCED level 2 only, academic only, academic and vocational, vocational) within the French Community.

*Data sources:* For the Flemish Community, data used for school sampling were obtained from the Ministry of Education and Training and referred to school year 2022/23. For the French Community, data used for school sampling were obtained from the General Administration of Education and referred to school year 2021/22.

**Table A D.19. School participation status: survey of principals – Belgium, ISCED level 2**

| Explicit stratum                                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Flemish Community – ISCED 2 only – Public         | 16                    | 0                  | 0                | 9                             | 1                                | 0                                 | 6                         |
| Flemish Community – ISCED 2 only – Private        | 60                    | 0                  | 0                | 32                            | 9                                | 0                                 | 19                        |
| Flemish Community – ISCED 2 and ISCED 3 – Public  | 36                    | 0                  | 0                | 23                            | 0                                | 0                                 | 13                        |
| Flemish Community – ISCED 2 and ISCED 3 – Private | 98                    | 0                  | 0                | 56                            | 6                                | 3                                 | 33                        |
| French Community – Public at the state level      | 38                    | 0                  | 0                | 31                            | 2                                | 0                                 | 5                         |
| French Community – Public at the local level      | 18                    | 0                  | 0                | 13                            | 2                                | 0                                 | 3                         |
| French Community – Private                        | 94                    | 3                  | 0                | 68                            | 6                                | 1                                 | 16                        |
| <b>Total</b>                                      | <b>360</b>            | <b>3</b>           | <b>0</b>         | <b>232</b>                    | <b>26</b>                        | <b>4</b>                          | <b>95</b>                 |

Table A D.20. School participation status: survey of teachers – Belgium, ISCED level 2

| Explicit stratum                                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Flemish Community – ISCED 2 only – Public         | 16                    | 0                  | 0                | 8                             | 1                                | 0                                 | 7                         |
| Flemish Community – ISCED 2 only – Private        | 60                    | 0                  | 0                | 34                            | 10                               | 1                                 | 15                        |
| Flemish Community – ISCED 2 and ISCED 3 – Public  | 36                    | 0                  | 0                | 23                            | 1                                | 0                                 | 12                        |
| Flemish Community – ISCED 2 and ISCED 3 – Private | 98                    | 0                  | 0                | 57                            | 5                                | 3                                 | 33                        |
| French Community – Public at the state level      | 38                    | 0                  | 0                | 33                            | 2                                | 0                                 | 3                         |
| French Community – Public at the local level      | 18                    | 0                  | 0                | 12                            | 2                                | 0                                 | 4                         |
| French Community – Private                        | 94                    | 3                  | 0                | 74                            | 6                                | 1                                 | 10                        |
| <b>Total</b>                                      | <b>360</b>            | <b>3</b>           | <b>0</b>         | <b>241</b>                    | <b>27</b>                        | <b>5</b>                          | <b>84</b>                 |

Table A D.21. Teacher participation status – Belgium, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 5 175        |
| Absent                  | 949          |
| Left school permanently | 42           |
| Not part of sample      | 48           |
| <b>Total</b>            | <b>6 214</b> |

### ***Flemish Community (Belgium): ISCED level 2***

ISCED level 2 in the Flemish Community of Belgium consists of “Reception class for immigrants”, “Regular secondary education – 1<sup>st</sup> stage” and “European School – 1<sup>st</sup> stage” and comprises Grades 7 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 210 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 2 only, ISCED levels 2 and 3) and funding with two categories (public, private).

*Implicit stratification:* Organised by educational network with three categories (education organised by the Flemish Community, government-aided public education, government-aided private education).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and Training and referred to school year 2022/23.

**Table A D.22. School participation status: survey of principals – Flemish Community (Belgium), ISCED level 2**

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public         | 16                    | 0                  | 0                | 9                             | 1                                | 0                                 | 6                         |
| ISCED 2 only – Private        | 60                    | 0                  | 0                | 32                            | 9                                | 0                                 | 19                        |
| ISCED 2 and ISCED 3 – Public  | 36                    | 0                  | 0                | 23                            | 0                                | 0                                 | 13                        |
| ISCED 2 and ISCED 3 – Private | 98                    | 0                  | 0                | 56                            | 6                                | 3                                 | 33                        |
| <b>Total</b>                  | <b>210</b>            | <b>0</b>           | <b>0</b>         | <b>120</b>                    | <b>16</b>                        | <b>3</b>                          | <b>71</b>                 |

**Table A D.23. School participation status: survey of teachers – Flemish Community (Belgium), ISCED level 2**

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public         | 16                    | 0                  | 0                | 8                             | 1                                | 0                                 | 7                         |
| ISCED 2 only – Private        | 60                    | 0                  | 0                | 34                            | 10                               | 1                                 | 15                        |
| ISCED 2 and ISCED 3 – Public  | 36                    | 0                  | 0                | 23                            | 1                                | 0                                 | 12                        |
| ISCED 2 and ISCED 3 – Private | 98                    | 0                  | 0                | 57                            | 5                                | 3                                 | 33                        |
| <b>Total</b>                  | <b>210</b>            | <b>0</b>           | <b>0</b>         | <b>122</b>                    | <b>17</b>                        | <b>4</b>                          | <b>67</b>                 |

**Table A D.24. Teacher participation status – Flemish Community (Belgium), ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 444        |
| Absent                  | 457          |
| Left school permanently | 17           |
| Not part of sample      | 29           |
| <b>Total</b>            | <b>2 947</b> |

### ***French Community (Belgium): ISCED level 2***

ISCED level 2 in the French Community of Belgium consists of “Regular secondary education – common first stage” and “Regular secondary education – differentiated first stage” and comprises Grades 7 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 students.

*Sample sizes:* 30 schools were selected for the field trial; 150 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by funding with three categories (public at the state level, public at the local level, private).

*Implicit stratification:* Organised by ISCED level 3 tracks with four categories (ISCED level 2 only, academic only, academic and vocational, vocational).

*Data sources:* Data used for school sampling were obtained from the General Administration of Education and referred to school year 2021/22.

**Table A D.25. School participation status: survey of principals – French Community (Belgium), ISCED level 2**

| Explicit stratum          | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public at the state level | 38                    | 0                  | 0                | 31                            | 2                                | 0                                 | 5                         |
| Public at the local level | 18                    | 0                  | 0                | 13                            | 2                                | 0                                 | 3                         |
| Private                   | 94                    | 3                  | 0                | 68                            | 6                                | 1                                 | 16                        |
| <b>Total</b>              | <b>150</b>            | <b>3</b>           | <b>0</b>         | <b>112</b>                    | <b>10</b>                        | <b>1</b>                          | <b>24</b>                 |

**Table A D.26. School participation status: survey of teachers – French Community (Belgium), ISCED level 2**

| Explicit stratum          | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public at the state level | 38                    | 0                  | 0                | 33                            | 2                                | 0                                 | 3                         |
| Public at the local level | 18                    | 0                  | 0                | 12                            | 2                                | 0                                 | 4                         |
| Private                   | 94                    | 3                  | 0                | 74                            | 6                                | 1                                 | 10                        |
| <b>Total</b>              | <b>150</b>            | <b>3</b>           | <b>0</b>         | <b>119</b>                    | <b>10</b>                        | <b>1</b>                          | <b>17</b>                 |

**Table A D.27. Teacher participation status – French Community (Belgium), ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 731        |
| Absent                  | 492          |
| Left school permanently | 25           |
| Not part of sample      | 19           |
| <b>Total</b>            | <b>3 267</b> |



### Brazil: ISCED level 2

ISCED level 2 in Brazil consists of “Fundamental education (Years 6-9)” and comprises Grades 6 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers; adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 33 schools were selected for the field trial; 250 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 2 only, ISCED levels 1 and 2) and type with four categories (federal, regional, local, private).

*Implicit stratification:* Organised by region with five categories (Central-West, North, Northeast, Southeast, South).

*Data sources:* Data used for school sampling were obtained from the national School Census and referred to 2022.

**Table A D.28. School participation status: survey of principals – Brazil, ISCED level 2**

| Explicit stratum               | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Federal         | 8                     | 0                  | 1                | 2                             | 2                                | 0                                 | 3                         |
| ISCED 2 only – Regional        | 66                    | 4                  | 0                | 60                            | 1                                | 0                                 | 1                         |
| ISCED 2 only – Local           | 24                    | 0                  | 1                | 22                            | 1                                | 0                                 | 0                         |
| ISCED 2 only – Private         | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Federal  | 8                     | 0                  | 0                | 3                             | 0                                | 0                                 | 5                         |
| ISCED 1 and ISCED 2 – Regional | 26                    | 0                  | 3                | 22                            | 0                                | 0                                 | 1                         |
| ISCED 1 and ISCED 2 – Local    | 66                    | 3                  | 4                | 55                            | 1                                | 2                                 | 1                         |
| ISCED 1 and ISCED 2 – Private  | 44                    | 1                  | 1                | 30                            | 3                                | 1                                 | 8                         |
| <b>Total</b>                   | <b>250</b>            | <b>9</b>           | <b>10</b>        | <b>201</b>                    | <b>8</b>                         | <b>3</b>                          | <b>19</b>                 |

**Table A D.29. School participation status: survey of teachers – Brazil, ISCED level 2**

| Explicit stratum               | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Federal         | 8                     | 0                  | 1                | 2                             | 2                                | 0                                 | 3                         |
| ISCED 2 only – Regional        | 66                    | 4                  | 0                | 59                            | 1                                | 0                                 | 2                         |
| ISCED 2 only – Local           | 24                    | 0                  | 1                | 22                            | 0                                | 0                                 | 1                         |
| ISCED 2 only – Private         | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Federal  | 8                     | 0                  | 0                | 3                             | 0                                | 0                                 | 5                         |
| ISCED 1 and ISCED 2 – Regional | 26                    | 0                  | 3                | 22                            | 0                                | 0                                 | 1                         |
| ISCED 1 and ISCED 2 – Local    | 66                    | 3                  | 4                | 53                            | 1                                | 2                                 | 3                         |
| ISCED 1 and ISCED 2 – Private  | 44                    | 1                  | 1                | 30                            | 2                                | 1                                 | 9                         |
| <b>Total</b>                   | <b>250</b>            | <b>9</b>           | <b>10</b>        | <b>198</b>                    | <b>6</b>                         | <b>3</b>                          | <b>24</b>                 |

Table A D.30. Teacher participation status – Brazil, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 009        |
| Absent                  | 143          |
| Left school permanently | 104          |
| Not part of sample      | 57           |
| <b>Total</b>            | <b>3 313</b> |

### Bulgaria: ISCED level 2

ISCED level 2 in Bulgaria consists of “Lower secondary stage of basic education” and comprises Grades 5 to 7 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to increase the number of big schools.

*Sample sizes:* 31 schools were selected for the field trial; 212 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by school structure with two categories (up to ISCED level 2, up to ISCED level 3) and school size with two categories (big, small).

*Implicit stratification:* Organised by urbanisation with four categories (capital, regional centre, city, village).

*Data sources:* Data used for school sampling were obtained from the National Center for Informatics Coverage of Education and referred to school year 2022/23.

**Table A D.1. School participation status: survey of principals – Bulgaria, ISCED level 2**

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Up to ISCED 2 – Big schools   | 30                    | 0                  | 0                | 29                            | 0                                | 0                                 | 1                         |
| Up to ISCED 2 – Small schools | 66                    | 1                  | 0                | 64                            | 0                                | 0                                 | 1                         |
| Up to ISCED 3 – Big schools   | 84                    | 0                  | 0                | 81                            | 1                                | 1                                 | 1                         |
| Up to ISCED 3 – Small schools | 32                    | 0                  | 0                | 31                            | 0                                | 1                                 | 0                         |
| <b>Total</b>                  | <b>212</b>            | <b>1</b>           | <b>0</b>         | <b>205</b>                    | <b>1</b>                         | <b>2</b>                          | <b>3</b>                  |

**Table A D.2. School participation status: survey of teachers – Bulgaria, ISCED level 2**

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Up to ISCED 2 – Big schools   | 30                    | 0                  | 0                | 29                            | 0                                | 0                                 | 1                         |
| Up to ISCED 2 – Small schools | 66                    | 1                  | 0                | 65                            | 0                                | 0                                 | 0                         |
| Up to ISCED 3 – Big schools   | 84                    | 0                  | 0                | 82                            | 1                                | 1                                 | 0                         |
| Up to ISCED 3 – Small schools | 32                    | 0                  | 0                | 31                            | 0                                | 1                                 | 0                         |
| <b>Total</b>                  | <b>212</b>            | <b>1</b>           | <b>0</b>         | <b>207</b>                    | <b>1</b>                         | <b>2</b>                          | <b>1</b>                  |

**Table A D.3. Teacher participation status – Bulgaria, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 629        |
| Absent                  | 31           |
| Left school permanently | 51           |
| Not part of sample      | 2            |
| <b>Total</b>            | <b>3 713</b> |

### Chile: ISCED level 2

ISCED level 2 in Chile consists of “Lower secondary education” and comprises Grades 7 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to increase the number of big schools.

*Sample sizes:* 34 schools were selected for the field trial; 467 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 2 only, ISCED levels 02 and 2), funding with three categories (public school, private school with public funds, private school) and size with two categories (small schools, big schools).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the schools and the National School Directory and referred to 2021.

**Table A D.1. School participation status: survey of principals – Chile, ISCED level 2**

| Explicit stratum                                                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public school – Small schools                            | 8                     | 1                  | 1                | 4                             | 1                                | 0                                 | 1                         |
| ISCED 2 only – Public school – Big schools                              | 30                    | 1                  | 0                | 15                            | 2                                | 0                                 | 12                        |
| ISCED 2 only – Private school with public funds – Small schools         | 8                     | 0                  | 0                | 4                             | 2                                | 0                                 | 2                         |
| ISCED 2 only – Private school with public funds – Big schools           | 20                    | 0                  | 0                | 10                            | 5                                | 2                                 | 3                         |
| ISCED 2 only – Private school – Small schools                           | 8                     | 0                  | 0                | 4                             | 1                                | 1                                 | 2                         |
| ISCED 2 only – Private school – Big schools                             | 8                     | 0                  | 0                | 5                             | 1                                | 0                                 | 2                         |
| ISCED 02 and ISCED 2 – Public school – Small schools                    | 52                    | 0                  | 0                | 44                            | 5                                | 0                                 | 3                         |
| ISCED 02 and ISCED 2 – Public school – Big schools                      | 80                    | 0                  | 0                | 59                            | 11                               | 4                                 | 6                         |
| ISCED 02 and ISCED 2 – Private school with public funds – Small schools | 34                    | 0                  | 1                | 24                            | 3                                | 1                                 | 5                         |
| ISCED 02 and ISCED 2 – Private school with public funds – Big schools   | 149                   | 0                  | 0                | 82                            | 26                               | 3                                 | 38                        |
| ISCED 02 and ISCED 2 – Private school – Small schools                   | 8                     | 0                  | 0                | 4                             | 1                                | 0                                 | 3                         |
| ISCED 02 and ISCED 2 – Private school – Big schools                     | 62                    | 0                  | 0                | 28                            | 5                                | 5                                 | 24                        |
| <b>Total</b>                                                            | <b>467</b>            | <b>2</b>           | <b>2</b>         | <b>283</b>                    | <b>63</b>                        | <b>16</b>                         | <b>101</b>                |

Table A D.2. School participation status: survey of teachers – Chile, ISCED level 2

| Explicit stratum                                                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public school – Small schools                            | 8                     | 1                  | 1                | 4                             | 1                                | 0                                 | 1                         |
| ISCED 2 only – Public school – Big schools                              | 30                    | 1                  | 0                | 15                            | 1                                | 0                                 | 13                        |
| ISCED 2 only – Private school with public funds – Small schools         | 8                     | 0                  | 0                | 4                             | 2                                | 0                                 | 2                         |
| ISCED 2 only – Private school with public funds – Big schools           | 20                    | 0                  | 0                | 11                            | 5                                | 2                                 | 2                         |
| ISCED 2 only – Private school – Small schools                           | 8                     | 0                  | 0                | 4                             | 1                                | 1                                 | 2                         |
| ISCED 2 only – Private school – Big schools                             | 8                     | 0                  | 0                | 5                             | 1                                | 0                                 | 2                         |
| ISCED 02 and ISCED 2 – Public school – Small schools                    | 52                    | 0                  | 0                | 44                            | 4                                | 0                                 | 4                         |
| ISCED 02 and ISCED 2 – Public school – Big schools                      | 80                    | 0                  | 0                | 55                            | 12                               | 4                                 | 9                         |
| ISCED 02 and ISCED 2 – Private school with public funds – Small schools | 34                    | 0                  | 1                | 24                            | 2                                | 1                                 | 6                         |
| ISCED 02 and ISCED 2 – Private school with public funds – Big schools   | 149                   | 0                  | 0                | 80                            | 26                               | 2                                 | 41                        |
| ISCED 02 and ISCED 2 – Private school – Small schools                   | 8                     | 0                  | 0                | 4                             | 1                                | 0                                 | 3                         |
| ISCED 02 and ISCED 2 – Private school – Big schools                     | 62                    | 0                  | 0                | 27                            | 5                                | 5                                 | 25                        |
| <b>Total</b>                                                            | <b>467</b>            | <b>2</b>           | <b>2</b>         | <b>277</b>                    | <b>61</b>                        | <b>15</b>                         | <b>110</b>                |

Table A D.3. Teacher participation status – Chile, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 319        |
| Absent                  | 520          |
| Left school permanently | 0            |
| Not part of sample      | 2            |
| <b>Total</b>            | <b>2 841</b> |

Table A D.4. School participation status: survey of teachers – Chile, TK5

| Explicit stratum                                                | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public school – Small schools                    | 8                     | 1                  | 1                | 4                             | 1                                | 0                                 | 1                         |
| ISCED 2 only – Public school – Big schools                      | 30                    | 1                  | 0                | 15                            | 1                                | 0                                 | 13                        |
| ISCED 2 only – Private school with public funds – Small schools | 8                     | 0                  | 0                | 4                             | 2                                | 0                                 | 2                         |
| ISCED 2 only – Private school with public funds – Big schools   | 20                    | 0                  | 0                | 9                             | 5                                | 2                                 | 4                         |
| ISCED 2 only – Private school – Small schools                   | 8                     | 0                  | 0                | 4                             | 0                                | 1                                 | 3                         |

| Explicit stratum                                                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Private school – Big schools                             | 8                     | 0                  | 0                | 5                             | 1                                | 0                                 | 2                         |
| ISCED 02 and ISCED 2 – Public school – Small schools                    | 51                    | 0                  | 0                | 42                            | 5                                | 0                                 | 4                         |
| ISCED 02 and ISCED 2 – Public school – Big schools                      | 80                    | 0                  | 0                | 54                            | 11                               | 4                                 | 11                        |
| ISCED 02 and ISCED 2 – Private school with public funds – Small schools | 34                    | 0                  | 1                | 24                            | 2                                | 1                                 | 6                         |
| ISCED 02 and ISCED 2 – Private school with public funds – Big schools   | 149                   | 0                  | 0                | 76                            | 25                               | 3                                 | 45                        |
| ISCED 02 and ISCED 2 – Private school – Small schools                   | 8                     | 0                  | 0                | 4                             | 1                                | 0                                 | 3                         |
| ISCED 02 and ISCED 2 – Private school – Big schools                     | 62                    | 0                  | 0                | 25                            | 5                                | 5                                 | 27                        |
| <b>Total</b>                                                            | <b>466</b>            | <b>2</b>           | <b>2</b>         | <b>266</b>                    | <b>59</b>                        | <b>16</b>                         | <b>121</b>                |

**Table A D.5. Teacher participation status – Chile, TKS**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 645        |
| Absent                  | 414          |
| Left school permanently | 0            |
| Not part of sample      | 1            |
| <b>Total</b>            | <b>2 060</b> |

### Colombia: ISCED level 2

ISCED level 2 in Colombia consists of “Basic secondary”, “Basic post-primary”, “Active secondary” and “Basic post-primary – New school methodology” and comprises Grades 6 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 students; adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 32 schools were selected for the field trial; 276 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED 2 only, ISCED 02 and ISCED 2), funding with two categories (public, private) and urbanisation for public schools with two categories (urban, rural).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of National Education (SIMAT MEN) and referred to 2023.

**Table A D.1. School participation status: survey of principals – Colombia, ISCED level 2**

| Explicit stratum                                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public – Urban – SIMAT MEN         | 78                    | 0                  | 0                | 52                            | 4                                | 0                                 | 22                        |
| ISCED 2 only – Public – Rural – SIMAT MEN         | 16                    | 0                  | 0                | 12                            | 0                                | 0                                 | 4                         |
| ISCED 2 only – Private – SIMAT MEN                | 8                     | 0                  | 0                | 4                             | 0                                | 0                                 | 4                         |
| ISCED 02 and ISCED 2 – Public – Urban – SIMAT MEN | 88                    | 0                  | 0                | 57                            | 3                                | 0                                 | 28                        |
| ISCED 02 and ISCED 2 – Public – Rural – SIMAT MEN | 42                    | 0                  | 0                | 28                            | 2                                | 0                                 | 12                        |
| ISCED 02 and ISCED 2 – Private – SIMAT MEN        | 44                    | 0                  | 0                | 23                            | 4                                | 0                                 | 17                        |
| <b>Total</b>                                      | <b>276</b>            | <b>0</b>           | <b>0</b>         | <b>176</b>                    | <b>13</b>                        | <b>0</b>                          | <b>87</b>                 |

**Table A D.2. School participation status: survey of teachers – Colombia, ISCED level 2**

| Explicit stratum                                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public – Urban – SIMAT MEN         | 78                    | 0                  | 0                | 60                            | 6                                | 0                                 | 12                        |
| ISCED 2 only – Public – Rural – SIMAT MEN         | 16                    | 0                  | 0                | 11                            | 0                                | 0                                 | 5                         |
| ISCED 2 only – Private – SIMAT MEN                | 8                     | 0                  | 0                | 5                             | 1                                | 0                                 | 2                         |
| ISCED 02 and ISCED 2 – Public – Urban – SIMAT MEN | 88                    | 0                  | 0                | 64                            | 3                                | 0                                 | 21                        |
| ISCED 02 and ISCED 2 – Public – Rural – SIMAT MEN | 42                    | 0                  | 0                | 31                            | 2                                | 0                                 | 9                         |

| Explicit stratum                           | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 02 and ISCED 2 – Private – SIMAT MEN | 44                    | 0                  | 0                | 27                            | 3                                | 0                                 | 14                        |
| <b>Total</b>                               | <b>276</b>            | <b>0</b>           | <b>0</b>         | <b>198</b>                    | <b>15</b>                        | <b>0</b>                          | <b>63</b>                 |

**Table A D.3. Teacher participation status – Colombia, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 010        |
| Absent                  | 265          |
| Left school permanently | 15           |
| Not part of sample      | 0            |
| <b>Total</b>            | <b>3 290</b> |



### Costa Rica: ISCED level 2

ISCED level 2 in Costa Rica consists of “General basic education – Cycle III – Academic daytime”, “General basic education – Cycle III – Technical daytime” and “Vocational – Cycle III (National Plan)” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between regions and between public and private schools.

*Sample sizes:* 30 schools were selected for the field trial; 216 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by region with four categories (Atlantic, Greater Metropolitan Area, North Zone and Guanacaste, Pacific) and funding with two categories (public, private and subsidised).

*Implicit stratification:* Organised by education stream with three categories (daytime academic, daytime technique, education for young people and adults).

*Data sources:* Data used for school sampling were obtained from the Ministry of Public Education and referred to 2021.

**Table A D.1. School participation status: survey of principals – Costa Rica, ISCED level 2**

| Explicit stratum                                   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Atlantic – Public                                  | 30                    | 0                  | 0                | 27                            | 0                                | 0                                 | 3                         |
| Atlantic – Private and subsidised                  | 8                     | 0                  | 0                | 6                             | 0                                | 0                                 | 2                         |
| Greater Metropolitan Area – Public                 | 86                    | 6                  | 0                | 72                            | 0                                | 0                                 | 8                         |
| Greater Metropolitan Area – Private and subsidised | 20                    | 0                  | 0                | 15                            | 0                                | 0                                 | 5                         |
| North Zone and Guanacaste – Public                 | 34                    | 0                  | 0                | 30                            | 0                                | 0                                 | 4                         |
| North Zone and Guanacaste – Private and subsidised | 8                     | 0                  | 0                | 5                             | 1                                | 0                                 | 2                         |
| Pacific – Public                                   | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Pacific – Private and subsidised                   | 8                     | 0                  | 0                | 3                             | 2                                | 0                                 | 3                         |
| <b>Total</b>                                       | <b>216</b>            | <b>6</b>           | <b>0</b>         | <b>180</b>                    | <b>3</b>                         | <b>0</b>                          | <b>27</b>                 |

**Table A D.2. School participation status: survey of teachers – Costa Rica, ISCED level 2**

| Explicit stratum                                   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Atlantic – Public                                  | 30                    | 0                  | 0                | 27                            | 0                                | 0                                 | 3                         |
| Atlantic – Private and subsidised                  | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Greater Metropolitan Area – Public                 | 86                    | 6                  | 0                | 72                            | 0                                | 0                                 | 8                         |
| Greater Metropolitan Area – Private and subsidised | 20                    | 0                  | 0                | 18                            | 0                                | 0                                 | 2                         |
| North Zone and Guanacaste – Public                 | 34                    | 0                  | 0                | 28                            | 0                                | 0                                 | 6                         |
| North Zone and Guanacaste – Private and subsidised | 8                     | 0                  | 0                | 6                             | 1                                | 0                                 | 1                         |
| Pacific – Public                                   | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |

| Explicit stratum                 | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Pacific – Private and subsidised | 8                     | 0                  | 0                | 4                             | 2                                | 0                                 | 2                         |
| <b>Total</b>                     | <b>216</b>            | <b>6</b>           | <b>0</b>         | <b>184</b>                    | <b>3</b>                         | <b>0</b>                          | <b>23</b>                 |

**Table A D.3. Teacher participation status – Costa Rica, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 026        |
| Absent                  | 188          |
| Left school permanently | 25           |
| Not part of sample      | 3            |
| <b>Total</b>            | <b>3 242</b> |

### Croatia: ISCED level 2

ISCED level 2 in Croatia consists of “Formal education in the upper grades of elementary school” and “Art education at the elementary level” and comprises Grades 5 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 students.

*Sample sizes:* 30 schools were selected for the field trial; 296 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by region with six categories (Central Croatia, City of Zagreb, Eastern Croatia, Northern Croatia, Southern Croatia, Western Croatia).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Science, Education and Youth and referred to school year 2020/21.

**Table A D.1. School participation status: survey of principals – Croatia, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Central Croatia  | 62                    | 0                  | 0                | 58                            | 0                                | 0                                 | 4                         |
| Eastern Croatia  | 46                    | 0                  | 0                | 38                            | 0                                | 0                                 | 8                         |
| Northern Croatia | 30                    | 0                  | 0                | 25                            | 0                                | 0                                 | 5                         |
| Western Croatia  | 34                    | 0                  | 0                | 32                            | 0                                | 0                                 | 2                         |
| Southern Croatia | 64                    | 0                  | 0                | 57                            | 0                                | 0                                 | 7                         |
| City of Zagreb   | 60                    | 0                  | 0                | 49                            | 0                                | 0                                 | 11                        |
| <b>Total</b>     | <b>296</b>            | <b>0</b>           | <b>0</b>         | <b>259</b>                    | <b>0</b>                         | <b>0</b>                          | <b>37</b>                 |

**Table A D.2. School participation status: survey of teachers – Croatia, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Central Croatia  | 62                    | 0                  | 0                | 57                            | 0                                | 0                                 | 5                         |
| Eastern Croatia  | 46                    | 0                  | 0                | 42                            | 0                                | 0                                 | 4                         |
| Northern Croatia | 30                    | 0                  | 0                | 27                            | 0                                | 0                                 | 3                         |
| Western Croatia  | 34                    | 0                  | 0                | 33                            | 0                                | 0                                 | 1                         |
| Southern Croatia | 64                    | 0                  | 0                | 56                            | 0                                | 0                                 | 8                         |
| City of Zagreb   | 60                    | 0                  | 0                | 53                            | 0                                | 0                                 | 7                         |
| <b>Total</b>     | <b>296</b>            | <b>0</b>           | <b>0</b>         | <b>268</b>                    | <b>0</b>                         | <b>0</b>                          | <b>28</b>                 |

Table A D.3. Teacher participation status – Croatia, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 163        |
| Absent                  | 665          |
| Left school permanently | 52           |
| Not part of sample      | 39           |
| <b>Total</b>            | <b>3 919</b> |

Table A D.4. School participation status: survey of teachers – Croatia, TKS

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Central Croatia  | 62                    | 0                  | 0                | 57                            | 0                                | 0                                 | 5                         |
| Eastern Croatia  | 46                    | 0                  | 0                | 42                            | 0                                | 0                                 | 4                         |
| Northern Croatia | 30                    | 0                  | 0                | 26                            | 0                                | 0                                 | 4                         |
| Western Croatia  | 34                    | 0                  | 0                | 32                            | 0                                | 0                                 | 2                         |
| Southern Croatia | 64                    | 0                  | 0                | 57                            | 0                                | 0                                 | 7                         |
| City of Zagreb   | 60                    | 0                  | 0                | 48                            | 0                                | 0                                 | 12                        |
| <b>Total</b>     | <b>296</b>            | <b>0</b>           | <b>0</b>         | <b>262</b>                    | <b>0</b>                         | <b>0</b>                          | <b>34</b>                 |

Table A D.5. Teacher participation status – Croatia, TKS

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 282        |
| Absent                  | 514          |
| Left school permanently | 37           |
| Not part of sample      | 19           |
| <b>Total</b>            | <b>2 852</b> |

### Cyprus: ISCED level 2

ISCED level 2 in Cyprus consists of “Public lower secondary general (Gymnasium)”, “Guests pupils – Gymnasiums” and “Private secondary general (Lower)” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Census.

*Sample sizes:* 10 schools were selected for the field trial; all 100 schools were asked to participate in the main survey. For the field trial, a smaller convenience sample was used to reduce the burden for schools already participating in the main survey.

*Method of sample selection:* Census.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by funding with two categories (public, private).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education, Sport and Youth and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Cyprus, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public           | 70                    | 0                  | 0                | 70                            | 0                                | 0                                 | 0                         |
| Private          | 30                    | 0                  | 0                | 29                            | 0                                | 0                                 | 1                         |
| <b>Total</b>     | <b>100</b>            | <b>0</b>           | <b>0</b>         | <b>99</b>                     | <b>0</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.2. School participation status: survey of teachers – Cyprus, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public           | 70                    | 0                  | 0                | 70                            | 0                                | 0                                 | 0                         |
| Private          | 30                    | 0                  | 0                | 29                            | 0                                | 0                                 | 1                         |
| <b>Total</b>     | <b>100</b>            | <b>0</b>           | <b>0</b>         | <b>99</b>                     | <b>0</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.3. Teacher participation status – Cyprus, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 793        |
| Absent                  | 172          |
| Left school permanently | 9            |
| Not part of sample      | 43           |
| <b>Total</b>            | <b>2 017</b> |

### Czechia: ISCED level 2

ISCED level 2 in Czechia consists of “Basic school – 2<sup>nd</sup> stage”, “Gymnasium – Lower stage of 8-year courses (1st to 4th grade)”, “Gymnasium – Lower stage of 6-year courses (1st and 2nd grade)”, “Conservatoire – Lower stage of 8-year courses (1st to 4th grade)” and “Basic school - Home schooling (2nd stage)” and comprises Grades 6 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation following the country’s request.

*Sample sizes:* 33 schools were selected for the field trial; 346 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by school type with 2 categories (elementary, gymnasium) and region with 14 categories for elementary schools.

*Implicit stratification:* Organised by region with 14 categories.

*Data sources:* Data used for school sampling were obtained from the Annual Statistics of the Ministry of Education, Youth and Sports and referred to school year 2022/23.

**Table A D.1. School participation status: survey of principals – Czechia, ISCED level 2**

| Explicit stratum                      | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Elementary – Prague                   | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Elementary – Central Bohemian Region  | 36                    | 0                  | 0                | 36                            | 0                                | 0                                 | 0                         |
| Elementary – South Bohemian Region    | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Plzeň Region             | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Karlovy Vary Region      | 20                    | 0                  | 0                | 19                            | 1                                | 0                                 | 0                         |
| Elementary – Ústí nad Labem Region    | 26                    | 0                  | 0                | 26                            | 0                                | 0                                 | 0                         |
| Elementary – Liberec Region           | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Hradec Králové Region    | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Pardubice Region         | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Vysočina Region          | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – South Moravian Region    | 26                    | 0                  | 0                | 26                            | 0                                | 0                                 | 0                         |
| Elementary – Olomouc Region           | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Zlín Region              | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Moravian-Silesian Region | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Gymnasium                             | 50                    | 0                  | 0                | 50                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                          | <b>346</b>            | <b>0</b>           | <b>0</b>         | <b>345</b>                    | <b>1</b>                         | <b>0</b>                          | <b>0</b>                  |

Table A D.2. School participation status: survey of teachers – Czechia, ISCED level 2

| Explicit stratum                      | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Elementary – Prague                   | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Elementary – Central Bohemian Region  | 36                    | 0                  | 0                | 36                            | 0                                | 0                                 | 0                         |
| Elementary – South Bohemian Region    | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Plzeň Region             | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Karlovy Vary Region      | 20                    | 0                  | 0                | 19                            | 1                                | 0                                 | 0                         |
| Elementary – Ústí nad Labem Region    | 26                    | 0                  | 0                | 26                            | 0                                | 0                                 | 0                         |
| Elementary – Liberec Region           | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Hradec Králové Region    | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Pardubice Region         | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Vysočina Region          | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – South Moravian Region    | 26                    | 0                  | 0                | 26                            | 0                                | 0                                 | 0                         |
| Elementary – Olomouc Region           | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Zlín Region              | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Elementary – Moravian-Silesian Region | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Gymnasium                             | 50                    | 0                  | 0                | 50                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                          | <b>346</b>            | <b>0</b>           | <b>0</b>         | <b>345</b>                    | <b>1</b>                         | <b>0</b>                          | <b>0</b>                  |

Table A D.3. Teacher participation status – Czechia, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 6 369        |
| Absent                  | 101          |
| Left school permanently | 10           |
| Not part of sample      | 18           |
| <b>Total</b>            | <b>6 498</b> |

### Denmark: ISCED level 2

The target population comprises metropolitan Denmark, not including the autonomous territories of the Faroe Islands and Greenland.

ISCED level 2 in Denmark consists of “Primary school 7th-9th grade” and “Primary school 10th grade” and comprises Grades 7 to 9/10 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 students.

*Sample sizes:* 30 schools were selected for the field trial; 240 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by funding with two categories (public, private) and size with three categories (small schools, medium-sized schools, large schools).

*Implicit stratification:* Organised by school type with two categories (elementary, boarding schools) for private schools.

*Data sources:* Data used for school sampling were obtained from the National Agency for IT and Learning and referred to school year 2020/21.

**Table A D.1. School participation status: survey of principals – Denmark, ISCED level 2**

| Explicit stratum               | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Small schools         | 16                    | 1                  | 0                | 11                            | 3                                | 0                                 | 1                         |
| Public – Medium-sized schools  | 50                    | 0                  | 0                | 27                            | 10                               | 2                                 | 11                        |
| Public – Large schools         | 102                   | 0                  | 0                | 52                            | 19                               | 5                                 | 26                        |
| Private – Small schools        | 24                    | 1                  | 0                | 11                            | 6                                | 1                                 | 5                         |
| Private – Medium-sized schools | 24                    | 0                  | 0                | 14                            | 5                                | 3                                 | 2                         |
| Private – Large schools        | 24                    | 0                  | 1                | 15                            | 4                                | 1                                 | 3                         |
| <b>Total</b>                   | <b>240</b>            | <b>2</b>           | <b>1</b>         | <b>130</b>                    | <b>47</b>                        | <b>12</b>                         | <b>48</b>                 |

**Table A D.2. School participation status: survey of teachers – Denmark, ISCED level 2**

| Explicit stratum               | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Small schools         | 16                    | 1                  | 0                | 11                            | 3                                | 0                                 | 1                         |
| Public – Medium-sized schools  | 50                    | 0                  | 0                | 26                            | 10                               | 2                                 | 12                        |
| Public – Large schools         | 102                   | 0                  | 0                | 54                            | 19                               | 5                                 | 24                        |
| Private – Small schools        | 24                    | 1                  | 0                | 10                            | 6                                | 1                                 | 6                         |
| Private – Medium-sized schools | 24                    | 0                  | 0                | 14                            | 5                                | 3                                 | 2                         |
| Private – Large schools        | 24                    | 0                  | 1                | 15                            | 4                                | 1                                 | 3                         |
| <b>Total</b>                   | <b>240</b>            | <b>2</b>           | <b>1</b>         | <b>130</b>                    | <b>47</b>                        | <b>12</b>                         | <b>48</b>                 |



Table A D.3. Teacher participation status – Denmark, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 488        |
| Absent                  | 440          |
| Left school permanently | 72           |
| Not part of sample      | 98           |
| <b>Total</b>            | <b>3 098</b> |

### Estonia: ISCED level 2

ISCED level 2 in Estonia consists of “Basic education (Grades 7-9 of basic school)”, “Second-level vocational training” and “Third-level vocational training” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 30 schools were selected for the field trial; 214 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by urbanisation with two categories (urban, rural) and school type with two categories (basic school, upper and lower secondary school).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Estonian Education Information System and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Estonia, ISCED level 2**

| Explicit stratum                         | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Urban – Basic school                     | 46                    | 1                  | 1                | 39                            | 0                                | 0                                 | 5                         |
| Urban – Upper and lower secondary school | 74                    | 6                  | 0                | 64                            | 0                                | 0                                 | 4                         |
| Rural – Basic school                     | 62                    | 2                  | 0                | 58                            | 0                                | 0                                 | 2                         |
| Rural – Upper and lower secondary school | 32                    | 0                  | 0                | 31                            | 0                                | 0                                 | 1                         |
| <b>Total</b>                             | <b>214</b>            | <b>9</b>           | <b>1</b>         | <b>192</b>                    | <b>0</b>                         | <b>0</b>                          | <b>12</b>                 |

**Table A D.2. School participation status: survey of teachers – Estonia, ISCED level 2**

| Explicit stratum                         | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Urban – Basic school                     | 46                    | 1                  | 1                | 43                            | 0                                | 0                                 | 1                         |
| Urban – Upper and lower secondary school | 74                    | 6                  | 0                | 67                            | 0                                | 0                                 | 1                         |
| Rural – Basic school                     | 62                    | 2                  | 0                | 57                            | 0                                | 0                                 | 3                         |
| Rural – Upper and lower secondary school | 32                    | 0                  | 0                | 32                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                             | <b>214</b>            | <b>9</b>           | <b>1</b>         | <b>199</b>                    | <b>0</b>                         | <b>0</b>                          | <b>5</b>                  |

**Table A D.3. Teacher participation status – Estonia, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 339        |
| Absent                  | 409          |
| Left school permanently | 10           |
| Not part of sample      | 5            |
| <b>Total</b>            | <b>3 763</b> |

### Finland: ISCED level 2

ISCED level 2 in Finland consists of “Comprehensive school grades 7-9 (10)” and comprises Grades 7 to 9/10 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between Finnish and Swedish schools and between urban/semi-urban and rural schools.

*Sample sizes:* 31 schools were selected for the field trial; 226 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by language with two categories (Finnish, Swedish), by region with four categories (Helsinki/Uusimaa, Northern and Eastern, Southern, Western) for Finnish schools and by urbanisation with two categories (urban and semi-urban, rural) for Finnish schools in Northern and Eastern, Southern, and Western and for Swedish schools.

*Implicit stratification:* Organised by region with four categories (Eastern, Western and Inland, Northern, Lapland) for Finnish schools in Northern and Eastern and by region with two categories (Mainland, Åland) for Swedish schools.

*Data sources:* Data used for school sampling were obtained from Statistics Finland and the Finnish National Agency for Education and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Finland, ISCED level 2**

| Explicit stratum                                      | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Finnish – Helsinki/Uusimaa                            | 56                    | 0                  | 0                | 55                            | 1                                | 0                                 | 0                         |
| Finnish – Southern – Urban and semi-urban             | 34                    | 0                  | 0                | 34                            | 0                                | 0                                 | 0                         |
| Finnish – Southern – Rural                            | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Finnish – Western – Urban and semi-urban              | 40                    | 0                  | 0                | 40                            | 0                                | 0                                 | 0                         |
| Finnish – Western – Rural                             | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Finnish – Northern and Eastern – Urban and semi-urban | 38                    | 0                  | 0                | 38                            | 0                                | 0                                 | 0                         |
| Finnish – Northern and Eastern – Rural                | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Swedish – Urban and semi-urban                        | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Swedish – Rural                                       | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| <b>Total</b>                                          | <b>226</b>            | <b>0</b>           | <b>0</b>         | <b>225</b>                    | <b>1</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.2. School participation status: survey of teachers – Finland, ISCED level 2**

| Explicit stratum                          | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Finnish – Helsinki/Uusimaa                | 56                    | 0                  | 0                | 55                            | 1                                | 0                                 | 0                         |
| Finnish – Southern – Urban and semi-urban | 34                    | 0                  | 0                | 34                            | 0                                | 0                                 | 0                         |
| Finnish – Southern – Rural                | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |

| Explicit stratum                                      | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Finnish – Western – Urban and semi-urban              | 40                    | 0                  | 0                | 40                            | 0                                | 0                                 | 0                         |
| Finnish – Western – Rural                             | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Finnish – Northern and Eastern – Urban and semi-urban | 38                    | 0                  | 0                | 38                            | 0                                | 0                                 | 0                         |
| Finnish – Northern and Eastern – Rural                | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Swedish – Urban and semi-urban                        | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Swedish – Rural                                       | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| <b>Total</b>                                          | <b>226</b>            | <b>0</b>           | <b>0</b>         | <b>225</b>                    | <b>1</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.3. Teacher participation status – Finland, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 300        |
| Absent                  | 236          |
| Left school permanently | 41           |
| Not part of sample      | 118          |
| <b>Total</b>            | <b>4 695</b> |

### France: ISCED level 2

ISCED level 2 in France consists of “Secondary education (1st cycle)” and comprises Grades 6 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 30 schools were selected for the field trial; 200 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by school sector with three categories (public school non-priority education, public school priority education, private school under contract with the state).

*Implicit stratification:* Organised by urbanisation with three categories (fewer than 10 000 inhabitants, 10 000 to 199 999 inhabitants, more than 199 999 inhabitants).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – France, ISCED level 2**

| Explicit stratum                             | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public school non-priority education         | 118                   | 1                  | 0                | 104                           | 0                                | 1                                 | 12                        |
| Public school priority education             | 32                    | 0                  | 0                | 29                            | 0                                | 0                                 | 3                         |
| Private school under contract with the state | 50                    | 2                  | 0                | 35                            | 2                                | 0                                 | 11                        |
| <b>Total</b>                                 | <b>200</b>            | <b>3</b>           | <b>0</b>         | <b>168</b>                    | <b>2</b>                         | <b>1</b>                          | <b>26</b>                 |

**Table A D.2. School participation status: survey of teachers – France, ISCED level 2**

| Explicit stratum                             | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public school non-priority education         | 118                   | 1                  | 0                | 95                            | 0                                | 1                                 | 21                        |
| Public school priority education             | 32                    | 0                  | 0                | 27                            | 0                                | 0                                 | 5                         |
| Private school under contract with the state | 50                    | 2                  | 0                | 36                            | 2                                | 0                                 | 10                        |
| <b>Total</b>                                 | <b>200</b>            | <b>3</b>           | <b>0</b>         | <b>158</b>                    | <b>2</b>                         | <b>1</b>                          | <b>36</b>                 |

**Table A D.3. Teacher participation status – France, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 877        |
| Absent                  | 889          |
| Left school permanently | 0            |
| Not part of sample      | 73           |
| <b>Total</b>            | <b>3 839</b> |

### Hungary: ISCED level 2

ISCED level 2 in Hungary consists of “Primary school lower secondary level (Grades 5-8), and Grades 5-8 of the upper secondary general school (full-time education)” and comprises Grades 5 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers, then adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 42 schools were selected for the field trial; 254 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by region with seven categories (Central Hungary, Central Transdanubia, Northern Great Plain, Northern Hungary, Southern Great Plain, Southern Transdanubia, Western Transdanubia) and by urbanisation with four categories (capital, county town, town, rural area).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Hungary, ISCED level 2**

| Explicit stratum                    | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Central Hungary – Capital           | 40                    | 0                  | 0                | 33                            | 1                                | 0                                 | 6                         |
| Central Hungary – Town              | 22                    | 2                  | 0                | 20                            | 0                                | 0                                 | 0                         |
| Central Hungary – Rural area        | 10                    | 0                  | 0                | 8                             | 0                                | 0                                 | 2                         |
| Central Transdanubia – County town  | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Central Transdanubia – Town         | 12                    | 0                  | 0                | 11                            | 0                                | 0                                 | 1                         |
| Central Transdanubia – Rural area   | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Northern Great Plain – County town  | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Northern Great Plain – Town         | 16                    | 2                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Northern Great Plain – Rural area   | 12                    | 1                  | 0                | 11                            | 0                                | 0                                 | 0                         |
| Northern Hungary – County town      | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Northern Hungary – Town             | 10                    | 1                  | 0                | 9                             | 0                                | 0                                 | 0                         |
| Northern Hungary – Rural area       | 14                    | 2                  | 0                | 11                            | 0                                | 0                                 | 1                         |
| Southern Great Plain – County town  | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Southern Great Plain – Town         | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Southern Great Plain – Rural area   | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Southern Transdanubia – County town | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Southern Transdanubia – Town        | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Southern Transdanubia – Rural area  | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Western Transdanubia – County town  | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Western Transdanubia – Town         | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Western Transdanubia – Rural area   | 10                    | 0                  | 0                | 8                             | 0                                | 0                                 | 2                         |
| <b>Total</b>                        | <b>254</b>            | <b>8</b>           | <b>0</b>         | <b>230</b>                    | <b>1</b>                         | <b>0</b>                          | <b>15</b>                 |

Table A D.2. School participation status: survey of teachers – Hungary, ISCED level 2

| Explicit stratum                    | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Central Hungary – Capital           | 40                    | 0                  | 0                | 36                            | 1                                | 0                                 | 3                         |
| Central Hungary – Town              | 22                    | 2                  | 0                | 19                            | 0                                | 0                                 | 1                         |
| Central Hungary – Rural area        | 10                    | 0                  | 0                | 9                             | 0                                | 0                                 | 1                         |
| Central Transdanubia – County town  | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Central Transdanubia – Town         | 12                    | 0                  | 0                | 11                            | 0                                | 0                                 | 1                         |
| Central Transdanubia – Rural area   | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Northern Great Plain – County town  | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Northern Great Plain – Town         | 16                    | 2                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Northern Great Plain – Rural area   | 12                    | 1                  | 0                | 11                            | 0                                | 0                                 | 0                         |
| Northern Hungary – County town      | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Northern Hungary – Town             | 10                    | 1                  | 0                | 9                             | 0                                | 0                                 | 0                         |
| Northern Hungary – Rural area       | 14                    | 2                  | 0                | 11                            | 0                                | 0                                 | 1                         |
| Southern Great Plain – County town  | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Southern Great Plain – Town         | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Southern Great Plain – Rural area   | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Southern Transdanubia – County town | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Southern Transdanubia – Town        | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Southern Transdanubia – Rural area  | 10                    | 0                  | 0                | 9                             | 0                                | 0                                 | 1                         |
| Western Transdanubia – County town  | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Western Transdanubia – Town         | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Western Transdanubia – Rural area   | 10                    | 0                  | 0                | 9                             | 0                                | 0                                 | 1                         |
| <b>Total</b>                        | <b>254</b>            | <b>8</b>           | <b>0</b>         | <b>234</b>                    | <b>1</b>                         | <b>0</b>                          | <b>11</b>                 |

Table A D.3. Teacher participation status – Hungary, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 890        |
| Absent                  | 313          |
| Left school permanently | 16           |
| Not part of sample      | 3            |
| <b>Total</b>            | <b>4 222</b> |

### ***Iceland: ISCED level 2***

ISCED level 2 in Iceland consists of “Lower secondary school (2nd section compulsory education)” and comprises Grades 8 to 10 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Census.

*Sample sizes:* 20 schools were selected for the field trial; all 146 schools were asked to participate in the main survey.

*Method of sample selection:* Census.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by region with three categories (Reykjavík, other Reykjavík area, outside Reykjavík area).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from Statistics Iceland and referred to 2021.

**Table A D.1. School participation status: survey of principals – Iceland, ISCED level 2**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Reykjavík              | 29                    | 1                  | 1                | 24                            | 0                                | 0                                 | 3                         |
| Other Reykjavík area   | 27                    | 0                  | 0                | 21                            | 0                                | 0                                 | 6                         |
| Outside Reykjavík area | 90                    | 4                  | 0                | 64                            | 0                                | 0                                 | 22                        |
| <b>Total</b>           | <b>146</b>            | <b>5</b>           | <b>1</b>         | <b>109</b>                    | <b>0</b>                         | <b>0</b>                          | <b>31</b>                 |

**Table A D.2. School participation status: survey of teachers – Iceland, ISCED level 2**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Reykjavík              | 29                    | 1                  | 1                | 26                            | 0                                | 0                                 | 1                         |
| Other Reykjavík area   | 27                    | 0                  | 0                | 24                            | 0                                | 0                                 | 3                         |
| Outside Reykjavík area | 90                    | 5                  | 0                | 81                            | 0                                | 0                                 | 4                         |
| <b>Total</b>           | <b>146</b>            | <b>6</b>           | <b>1</b>         | <b>131</b>                    | <b>0</b>                         | <b>0</b>                          | <b>8</b>                  |

**Table A D.3. Teacher participation status – Iceland, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 427        |
| Absent                  | 322          |
| Left school permanently | 37           |
| Not part of sample      | 46           |
| <b>Total</b>            | <b>1 832</b> |



### Israel: ISCED level 2

ISCED level 2 in Israel consists of “Lower secondary education, public” and “Lower secondary education, government-dependent private” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to oversample specific orientations.

*Sample sizes:* 32 schools were selected for the field trial; 305 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by orientation with six categories (Hebrew secular, Hebrew religious, Arabic Arab, Arabic Druze, Arabic Bedouin, Hebrew ultra-Orthodox), likeliness to participate with two categories (potential educational streams, non-potential education streams) for Hebrew ultra-Orthodox and gender with two categories (male, female) for Hebrew ultra-Orthodox potential educational streams.

*Implicit stratification:* Organised by socio-economic status with three categories (low, medium, high) for Hebrew secular, Hebrew religious male, Hebrew religious female, Arabic Arab and Arabic Druze, region with two categories (north, south) for Arabic Bedouin, tracks/streams with six categories (Mukarim-Much'shar, Bney Yoseph-Much'shar, Mamach-Rishmi, Much'shar, Patur, Tarbuti Yichudi) for Hebrew ultra-Orthodox and gender with three categories (male, female, mixed) for Hebrew religious and Much'shar.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2023/24.

*Weighting:* The strata “Hebrew ultra-Orthodox – Potential educational streams – Male”, “Hebrew ultra-Orthodox – Potential educational streams – Female” and “Hebrew ultra-Orthodox – Non-potential educational streams” were treated as excluded because few schools participated.

**Table A D.1. School participation status: survey of principals – Israel, ISCED level 2**

| Explicit stratum                                               | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Hebrew secular                                                 | 124                   | 8                  | 0                | 108                           | 0                                | 0                                 | 8                         |
| Hebrew religious                                               | 41                    | 4                  | 0                | 29                            | 1                                | 0                                 | 7                         |
| Arabic Arab                                                    | 36                    | 0                  | 0                | 36                            | 0                                | 0                                 | 0                         |
| Arabic Druze                                                   | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Arabic Bedouin                                                 | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Hebrew ultra-Orthodox – Potential educational streams – Male   | 22                    | 1                  | 21               | 0                             | 0                                | 0                                 | 0                         |
| Hebrew ultra-Orthodox – Potential educational streams – Female | 34                    | 0                  | 34               | 0                             | 0                                | 0                                 | 0                         |
| Hebrew ultra-Orthodox – Non-potential educational streams      | 24                    | 0                  | 24               | 0                             | 0                                | 0                                 | 0                         |
| <b>Total</b>                                                   | <b>305</b>            | <b>13</b>          | <b>79</b>        | <b>197</b>                    | <b>1</b>                         | <b>0</b>                          | <b>15</b>                 |

Table A D.2. School participation status: survey of teachers – Israel, ISCED level 2

| Explicit stratum                                               | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Hebrew secular                                                 | 124                   | 8                  | 0                | 108                           | 0                                | 0                                 | 8                         |
| Hebrew religious                                               | 41                    | 4                  | 0                | 28                            | 0                                | 0                                 | 9                         |
| Arabic Arab                                                    | 36                    | 0                  | 0                | 36                            | 0                                | 0                                 | 0                         |
| Arabic Druze                                                   | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Arabic Bedouin                                                 | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Hebrew ultra-Orthodox – Potential educational streams – Male   | 22                    | 1                  | 21               | 0                             | 0                                | 0                                 | 0                         |
| Hebrew ultra-Orthodox – Potential educational streams – Female | 34                    | 0                  | 34               | 0                             | 0                                | 0                                 | 0                         |
| Hebrew ultra-Orthodox – Non-potential educational streams      | 24                    | 0                  | 24               | 0                             | 0                                | 0                                 | 0                         |
| <b>Total</b>                                                   | <b>305</b>            | <b>13</b>          | <b>79</b>        | <b>196</b>                    | <b>0</b>                         | <b>0</b>                          | <b>17</b>                 |

Table A D.3. Teacher participation status – Israel, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 227        |
| Absent                  | 464          |
| Left school permanently | 17           |
| Not part of sample      | 34           |
| <b>Total</b>            | <b>3 742</b> |

### Italy: ISCED level 2

ISCED level 2 in Italy consists of “Lower secondary education” and comprises Grades 6 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 30 schools were selected for the field trial; 202 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by region with three categories (north, centre, south).

*Implicit stratification:* Organised by funding with two categories (public, private) and student average performance with three categories (low, medium or missing, high) within public schools.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and Merit and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Italy, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| North            | 88                    | 0                  | 0                | 86                            | 1                                | 0                                 | 1                         |
| Centre           | 38                    | 0                  | 0                | 36                            | 0                                | 0                                 | 2                         |
| South            | 76                    | 0                  | 0                | 75                            | 0                                | 0                                 | 1                         |
| <b>Total</b>     | <b>202</b>            | <b>0</b>           | <b>0</b>         | <b>197</b>                    | <b>1</b>                         | <b>0</b>                          | <b>4</b>                  |

**Table A D.2. School participation status: survey of teachers – Italy, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| North            | 88                    | 0                  | 0                | 87                            | 1                                | 0                                 | 0                         |
| Centre           | 38                    | 0                  | 0                | 37                            | 0                                | 0                                 | 1                         |
| South            | 76                    | 0                  | 0                | 75                            | 0                                | 0                                 | 1                         |
| <b>Total</b>     | <b>202</b>            | <b>0</b>           | <b>0</b>         | <b>199</b>                    | <b>1</b>                         | <b>0</b>                          | <b>2</b>                  |

**Table A D.3. Teacher participation status – Italy, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 874        |
| Absent                  | 320          |
| Left school permanently | 12           |
| Not part of sample      | 10           |
| <b>Total</b>            | <b>4 216</b> |

### Japan: ISCED level 2

ISCED level 2 in Japan consists of “Lower secondary school”, “Compulsory education school” and “Secondary education school (lower division)” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers, then adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 31 schools were selected for the field trial; 208 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 2 only, ISCED levels 1 and 2), funding with two categories (public, national or private) for ISCED level 2 only schools and urbanisation with four categories (very large city, large city, small city, non-city area) for ISCED level 2 only public schools.

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education, Culture, Sports, Science and Technology and referred to 2021.

**Table A D.1. School participation status: survey of principals – Japan, ISCED level 2**

| Explicit stratum                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public – Very large city | 40                    | 0                  | 0                | 37                            | 3                                | 0                                 | 0                         |
| ISCED 2 only – Public – Large city      | 28                    | 0                  | 0                | 27                            | 1                                | 0                                 | 0                         |
| ISCED 2 only – Public – Small city      | 86                    | 0                  | 0                | 80                            | 5                                | 0                                 | 1                         |
| ISCED 2 only – Public – Non-city area   | 22                    | 0                  | 0                | 19                            | 2                                | 0                                 | 1                         |
| ISCED 2 only – National or private      | 24                    | 0                  | 0                | 16                            | 3                                | 3                                 | 2                         |
| ISCED 1 and ISCED 2                     | 4                     | 0                  | 0                | 4                             | 0                                | 0                                 | 0                         |
| <b>Total</b>                            | <b>204</b>            | <b>0</b>           | <b>0</b>         | <b>183</b>                    | <b>14</b>                        | <b>3</b>                          | <b>4</b>                  |

**Table A D.2. School participation status: survey of teachers – Japan, ISCED level 2**

| Explicit stratum                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public – Very large city | 40                    | 0                  | 0                | 37                            | 3                                | 0                                 | 0                         |
| ISCED 2 only – Public – Large city      | 28                    | 0                  | 0                | 27                            | 1                                | 0                                 | 0                         |
| ISCED 2 only – Public – Small city      | 86                    | 0                  | 0                | 80                            | 5                                | 0                                 | 1                         |
| ISCED 2 only – Public – Non-city area   | 22                    | 0                  | 0                | 19                            | 2                                | 0                                 | 1                         |
| ISCED 2 only – National or private      | 24                    | 0                  | 0                | 17                            | 3                                | 3                                 | 1                         |
| ISCED 1 and ISCED 2                     | 4                     | 0                  | 0                | 4                             | 0                                | 0                                 | 0                         |
| <b>Total</b>                            | <b>204</b>            | <b>0</b>           | <b>0</b>         | <b>184</b>                    | <b>14</b>                        | <b>3</b>                          | <b>3</b>                  |

Table A D.3. Teacher participation status – Japan, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 558        |
| Absent                  | 85           |
| Left school permanently | 31           |
| Not part of sample      | 5            |
| <b>Total</b>            | <b>3 679</b> |

## Kazakhstan: ISCED level 2

ISCED level 2 in Kazakhstan consists of “Lower secondary education” and comprises Grades 5 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between regions and between public and private schools.

*Sample sizes:* 42 schools were selected for the field trial; 399 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by region with 13 categories and funding with 2 categories (public, private).

*Implicit stratification:* Organised by language with three categories (Kazakh, Kazakh and Russian, Russian).

*Data sources:* Data used for school sampling were obtained from the National Education Database and referred to 2022.

**Table A D.1. School participation status: survey of principals – Kazakhstan, ISCED level 2**

| Explicit stratum                                                                | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Astana city – Public                                                            | 22                    | 0                  | 0                | 21                            | 0                                | 0                                 | 1                         |
| Astana city – Private                                                           | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| Almaty city – Public                                                            | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Almaty city – Private                                                           | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| Shymkent city – Public                                                          | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Shymkent city – Private                                                         | 8                     | 2                  | 0                | 6                             | 0                                | 0                                 | 0                         |
| Northern Kazakhstan (Akmola Region, Kostanay Region, Pavlodar Region) – Public  | 20                    | 0                  | 0                | 20                            | 0                                | 0                                 | 0                         |
| Northern Kazakhstan (Akmola Region, Kostanay Region, Pavlodar Region) – Private | 6                     | 1                  | 0                | 5                             | 0                                | 0                                 | 0                         |
| Northern Kazakhstan (North Kazakhstan Region) – Public                          | 28                    | 1                  | 0                | 27                            | 0                                | 0                                 | 0                         |
| Northern Kazakhstan (North Kazakhstan Region) – Private                         | 2                     | 0                  | 0                | 2                             | 0                                | 0                                 | 0                         |
| Central Kazakhstan (Karaganda Region, Ulytau Region) – Public                   | 24                    | 0                  | 0                | 23                            | 0                                | 0                                 | 1                         |
| Central Kazakhstan (Karaganda Region, Ulytau Region) – Private                  | 7                     | 1                  | 0                | 5                             | 0                                | 0                                 | 1                         |
| Eastern Kazakhstan (East Kazakhstan Region, Abai Region) – Public               | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Eastern Kazakhstan (East Kazakhstan Region, Abai Region) – Private              | 7                     | 2                  | 0                | 5                             | 0                                | 0                                 | 0                         |
| Southern Kazakhstan (Jambyl Region, Kyzylorda Region, Jetisu Region) – Public   | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Southern Kazakhstan (Jambyl Region, Kyzylorda Region, Jetisu Region) – Private  | 8                     | 2                  | 0                | 6                             | 0                                | 0                                 | 0                         |

| Explicit stratum                                                     | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Southern Kazakhstan (Almaty Region) – Public                         | 22                    | 0                  | 0                | 21                            | 0                                | 0                                 | 1                         |
| Southern Kazakhstan (Almaty Region) – Private                        | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| Southern Kazakhstan (Turkistan Region) – Public                      | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Southern Kazakhstan (Turkistan Region) – Private                     | 8                     | 1                  | 0                | 6                             | 0                                | 0                                 | 1                         |
| Western Kazakhstan (West Kazakhstan Region, Aktobe Region) – Public  | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Western Kazakhstan (West Kazakhstan Region, Aktobe Region) – Private | 8                     | 2                  | 0                | 6                             | 0                                | 0                                 | 0                         |
| Western Kazakhstan (Atyrau Region) – Public                          | 24                    | 1                  | 0                | 23                            | 0                                | 0                                 | 0                         |
| Western Kazakhstan (Atyrau Region) – Private                         | 7                     | 2                  | 0                | 5                             | 0                                | 0                                 | 0                         |
| Western Kazakhstan (Mangystau Region) – Public                       | 22                    | 0                  | 0                | 20                            | 0                                | 0                                 | 2                         |
| Western Kazakhstan (Mangystau Region) – Private                      | 8                     | 3                  | 0                | 5                             | 0                                | 0                                 | 0                         |
| <b>Total</b>                                                         | <b>399</b>            | <b>21</b>          | <b>0</b>         | <b>371</b>                    | <b>0</b>                         | <b>0</b>                          | <b>7</b>                  |

Table A D.2. School participation status: survey of teachers – Kazakhstan, ISCED level 2

| Explicit stratum                                                                | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Astana city – Public                                                            | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Astana city – Private                                                           | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| Almaty city – Public                                                            | 22                    | 0                  | 0                | 21                            | 0                                | 0                                 | 1                         |
| Almaty city – Private                                                           | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| Shymkent city – Public                                                          | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Shymkent city – Private                                                         | 8                     | 2                  | 0                | 6                             | 0                                | 0                                 | 0                         |
| Northern Kazakhstan (Akmola Region, Kostanay Region, Pavlodar Region) – Public  | 20                    | 0                  | 0                | 20                            | 0                                | 0                                 | 0                         |
| Northern Kazakhstan (Akmola Region, Kostanay Region, Pavlodar Region) – Private | 6                     | 1                  | 0                | 5                             | 0                                | 0                                 | 0                         |
| Northern Kazakhstan (North Kazakhstan Region) – Public                          | 28                    | 1                  | 0                | 27                            | 0                                | 0                                 | 0                         |
| Northern Kazakhstan (North Kazakhstan Region) – Private                         | 2                     | 0                  | 0                | 2                             | 0                                | 0                                 | 0                         |
| Central Kazakhstan (Karaganda Region, Ulytau Region) – Public                   | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Central Kazakhstan (Karaganda Region, Ulytau Region) – Private                  | 7                     | 1                  | 0                | 6                             | 0                                | 0                                 | 0                         |
| Eastern Kazakhstan (East Kazakhstan Region, Abai Region) – Public               | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Eastern Kazakhstan (East Kazakhstan Region, Abai Region) – Private              | 7                     | 2                  | 0                | 5                             | 0                                | 0                                 | 0                         |

| Explicit stratum                                                               | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Southern Kazakhstan (Jambyl Region, Kyzylorda Region, Jetisu Region) – Public  | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Southern Kazakhstan (Jambyl Region, Kyzylorda Region, Jetisu Region) – Private | 8                     | 2                  | 0                | 6                             | 0                                | 0                                 | 0                         |
| Southern Kazakhstan (Almaty Region) – Public                                   | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Southern Kazakhstan (Almaty Region) – Private                                  | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| Southern Kazakhstan (Turkistan Region) – Public                                | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Southern Kazakhstan (Turkistan Region) – Private                               | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| Western Kazakhstan (West Kazakhstan Region, Aktobe Region) – Public            | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Western Kazakhstan (West Kazakhstan Region, Aktobe Region) – Private           | 8                     | 2                  | 0                | 6                             | 0                                | 0                                 | 0                         |
| Western Kazakhstan (Atyrau Region) – Public                                    | 24                    | 1                  | 0                | 23                            | 0                                | 0                                 | 0                         |
| Western Kazakhstan (Atyrau Region) – Private                                   | 7                     | 2                  | 0                | 5                             | 0                                | 0                                 | 0                         |
| Western Kazakhstan (Mangystau Region) – Public                                 | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Western Kazakhstan (Mangystau Region) – Private                                | 8                     | 3                  | 0                | 5                             | 0                                | 0                                 | 0                         |
| <b>Total</b>                                                                   | <b>399</b>            | <b>21</b>          | <b>0</b>         | <b>377</b>                    | <b>0</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.3. Teacher participation status – Kazakhstan, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 7 360        |
| Absent                  | 34           |
| Left school permanently | 11           |
| Not part of sample      | 5            |
| <b>Total</b>            | <b>7 410</b> |



## Korea: ISCED level 2

ISCED level 2 in Korea consists of “Middle school” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 31 schools were selected for the field trial; 202 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by urbanisation with three categories (large city, city, town) and funding with two categories (public, private).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Center for Educational Statistics (KEDI) and referred to 2021.

**Table A D.1. School participation status: survey of principals – Korea, ISCED level 2**

| Explicit stratum     | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Large city – Public  | 62                    | 0                  | 0                | 46                            | 9                                | 0                                 | 7                         |
| Large city – Private | 16                    | 0                  | 0                | 15                            | 1                                | 0                                 | 0                         |
| City – Public        | 72                    | 0                  | 0                | 47                            | 13                               | 1                                 | 11                        |
| City – Private       | 10                    | 0                  | 0                | 1                             | 5                                | 2                                 | 2                         |
| Town – Public        | 34                    | 0                  | 0                | 22                            | 7                                | 1                                 | 4                         |
| Town – Private       | 8                     | 0                  | 0                | 1                             | 2                                | 0                                 | 5                         |
| <b>Total</b>         | <b>202</b>            | <b>0</b>           | <b>0</b>         | <b>132</b>                    | <b>37</b>                        | <b>4</b>                          | <b>29</b>                 |

**Table A D.2. School participation status: survey of teachers – Korea, ISCED level 2**

| Explicit stratum     | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Large city – Public  | 62                    | 0                  | 0                | 47                            | 7                                | 0                                 | 8                         |
| Large city – Private | 16                    | 0                  | 0                | 13                            | 1                                | 0                                 | 2                         |
| City – Public        | 72                    | 0                  | 0                | 44                            | 13                               | 0                                 | 15                        |
| City – Private       | 10                    | 0                  | 0                | 2                             | 5                                | 2                                 | 1                         |
| Town – Public        | 34                    | 0                  | 0                | 23                            | 4                                | 2                                 | 5                         |
| Town – Private       | 8                     | 0                  | 0                | 3                             | 3                                | 0                                 | 2                         |
| <b>Total</b>         | <b>202</b>            | <b>0</b>           | <b>0</b>         | <b>132</b>                    | <b>33</b>                        | <b>4</b>                          | <b>33</b>                 |

**Table A D.3. Teacher participation status – Korea, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 098        |
| Absent                  | 305          |
| Left school permanently | 5            |
| Not part of sample      | 7            |
| <b>Total</b>            | <b>3 415</b> |

## Kosovo: ISCED level 2

ISCED level 2 in Kosovo consists of lower secondary education and comprises Grades 6 to 9.

*Sample allocation:* Disproportional allocation to reduce the number of big schools in the sample for overlap control.

*Sample sizes:* 30 schools were selected for the field trial; 224 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by districts with seven categories (Ferizaj, Gjakova, Gjilan, Mitrovica, Peja, Pristina, Prizren) and size with two categories (big, small) for Gjakova, Peja and Pristina.

*Implicit stratification:* Organised by urbanisation with two categories (urban, rural).

*Data sources:* Data used for school sampling were obtained from the municipalities and referred to 2023.

**Table A D.1. School participation status: survey of principals – Kosovo, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Ferizaj          | 34                    | 0                  | 0                | 34                            | 0                                | 0                                 | 0                         |
| Gjakova – Big    | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Gjakova – Small  | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Gjilan           | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Mitrovica        | 28                    | 0                  | 0                | 27                            | 0                                | 0                                 | 1                         |
| Peja – Big       | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Peja – Small     | 18                    | 0                  | 0                | 18                            | 0                                | 0                                 | 0                         |
| Pristina – Big   | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Pristina – Small | 48                    | 0                  | 0                | 47                            | 0                                | 0                                 | 1                         |
| Prizren          | 28                    | 0                  | 0                | 28                            | 0                                | 0                                 | 0                         |
| <b>Total</b>     | <b>224</b>            | <b>0</b>           | <b>0</b>         | <b>222</b>                    | <b>0</b>                         | <b>0</b>                          | <b>2</b>                  |

**Table A D.2. School participation status: survey of teachers – Kosovo, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Ferizaj          | 34                    | 0                  | 0                | 34                            | 0                                | 0                                 | 0                         |
| Gjakova – Big    | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Gjakova – Small  | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Gjilan           | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Mitrovica        | 28                    | 0                  | 0                | 27                            | 0                                | 0                                 | 1                         |
| Peja – Big       | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Peja – Small     | 18                    | 0                  | 0                | 18                            | 0                                | 0                                 | 0                         |
| Pristina – Big   | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Pristina – Small | 48                    | 0                  | 0                | 47                            | 0                                | 0                                 | 1                         |
| Prizren          | 28                    | 0                  | 0                | 28                            | 0                                | 0                                 | 0                         |
| <b>Total</b>     | <b>224</b>            | <b>0</b>           | <b>0</b>         | <b>222</b>                    | <b>0</b>                         | <b>0</b>                          | <b>2</b>                  |

Table A D.3. Teacher participation status – Kosovo, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 281        |
| Absent                  | 309          |
| Left school permanently | 28           |
| Not part of sample      | 1            |
| <b>Total</b>            | <b>3 619</b> |

### Latvia: ISCED level 2

ISCED level 2 in Latvia consists of “General basic education, offered as 9 years long programme (grades 1-9), spanning two ISCED 2011 levels”, “General basic education, second stage (grades 7-9)”, “Vocational basic education, implemented without limitations to previous educational attainment” and “Vocational education (acquisition of 2<sup>nd</sup> level professional qualification), for children who have not completed full basic education. Duration of programme 3 years” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 students.

*Sample sizes:* 30 schools were selected for the field trial; 221 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by school type with three categories (basic, secondary, gymnasium) and urbanisation with three categories (Riga, city, town/rural)

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and Science and referred to school year 2022/23.

**Table A D.1. School participation status: survey of principals – Latvia, ISCED level 2**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Basic – Riga           | 14                    | 1                  | 0                | 13                            | 0                                | 0                                 | 0                         |
| Basic – City           | 10                    | 0                  | 0                | 9                             | 1                                | 0                                 | 0                         |
| Basic – Town/rural     | 34                    | 1                  | 0                | 32                            | 0                                | 0                                 | 1                         |
| Secondary – Riga       | 52                    | 1                  | 0                | 50                            | 0                                | 0                                 | 1                         |
| Secondary – City       | 30                    | 0                  | 0                | 27                            | 1                                | 0                                 | 2                         |
| Secondary – Town/rural | 54                    | 0                  | 0                | 53                            | 1                                | 0                                 | 0                         |
| Gymnasium – Riga       | 6                     | 0                  | 0                | 5                             | 0                                | 0                                 | 1                         |
| Gymnasium – City       | 9                     | 0                  | 0                | 9                             | 0                                | 0                                 | 0                         |
| Gymnasium – Town/rural | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| <b>Total</b>           | <b>221</b>            | <b>3</b>           | <b>0</b>         | <b>210</b>                    | <b>3</b>                         | <b>0</b>                          | <b>5</b>                  |

**Table A D.2. School participation status: survey of teachers – Latvia, ISCED level 2**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Basic – Riga           | 14                    | 1                  | 0                | 13                            | 0                                | 0                                 | 0                         |
| Basic – City           | 10                    | 0                  | 0                | 9                             | 1                                | 0                                 | 0                         |
| Basic – Town/rural     | 34                    | 1                  | 0                | 33                            | 0                                | 0                                 | 0                         |
| Secondary – Riga       | 52                    | 1                  | 0                | 49                            | 0                                | 0                                 | 2                         |
| Secondary – City       | 30                    | 0                  | 0                | 28                            | 1                                | 0                                 | 1                         |
| Secondary – Town/rural | 54                    | 0                  | 0                | 53                            | 1                                | 0                                 | 0                         |
| Gymnasium – Riga       | 6                     | 0                  | 0                | 6                             | 0                                | 0                                 | 0                         |
| Gymnasium – City       | 9                     | 0                  | 0                | 9                             | 0                                | 0                                 | 0                         |

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Gymnasium – Town/rural | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| <b>Total</b>           | <b>221</b>            | <b>3</b>           | <b>0</b>         | <b>212</b>                    | <b>3</b>                         | <b>0</b>                          | <b>3</b>                  |

**Table A D.3. Teacher participation status – Latvia, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 088        |
| Absent                  | 403          |
| Left school permanently | 23           |
| Not part of sample      | 14           |
| <b>Total</b>            | <b>4 528</b> |

### Lithuania: ISCED level 2

ISCED level 2 in Lithuania consists of “General lower secondary (basic) education programmes”, “Vocational education programmes for person without basic education aimed at the acquisition of a professional qualification and basic education” and “Vocational education programmes for person without basic education aimed at the acquisition of a professional qualification” and comprises Grades 5 to 10 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 students.

*Sample sizes:* 30 schools were selected for the field trial; 212 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by urbanisation with four categories (capital, other major cities, towns, small towns and villages).

*Implicit stratification:* Organised by language with two categories (Lithuanian, other).

*Data sources:* Data used for school sampling were obtained from the National Agency for Education under the Ministry of Education and Science and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Lithuania, ISCED level 2**

| Explicit stratum         | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Capital                  | 48                    | 0                  | 0                | 47                            | 1                                | 0                                 | 0                         |
| Other major cities       | 54                    | 0                  | 0                | 54                            | 0                                | 0                                 | 0                         |
| Towns                    | 76                    | 0                  | 0                | 76                            | 0                                | 0                                 | 0                         |
| Small towns and villages | 34                    | 1                  | 0                | 33                            | 0                                | 0                                 | 0                         |
| <b>Total</b>             | <b>212</b>            | <b>1</b>           | <b>0</b>         | <b>210</b>                    | <b>1</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.2. School participation status: survey of teachers – Lithuania, ISCED level 2**

| Explicit stratum         | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Capital                  | 48                    | 0                  | 0                | 46                            | 1                                | 0                                 | 1                         |
| Other major cities       | 54                    | 0                  | 0                | 54                            | 0                                | 0                                 | 0                         |
| Towns                    | 76                    | 0                  | 0                | 76                            | 0                                | 0                                 | 0                         |
| Small towns and villages | 34                    | 1                  | 0                | 33                            | 0                                | 0                                 | 0                         |
| <b>Total</b>             | <b>212</b>            | <b>1</b>           | <b>0</b>         | <b>209</b>                    | <b>1</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.3. Teacher participation status – Lithuania, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 223        |
| Absent                  | 126          |
| Left school permanently | 11           |
| Not part of sample      | 2            |
| <b>Total</b>            | <b>4 362</b> |

**Malta: ISCED level 2**

ISCED level 2 in Malta consists of “Lower secondary general education”, “Lower secondary vocational education”, “Lower secondary vocational education” and “Introductory certificate” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Census.

*Sample sizes:* 6 schools were selected for the field trial; all 56 schools were asked to participate in the main survey.

*Method of sample selection:* Census.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by provider with three categories (state, church, independent).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Human Resources Department and Quality Assurance Department within the Ministry for Education, Sport, Youth, Research and Innovation and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Malta, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| State            | 24                    | 1                  | 0                | 21                            | 0                                | 0                                 | 2                         |
| Church           | 22                    | 0                  | 0                | 21                            | 0                                | 0                                 | 1                         |
| Independent      | 10                    | 0                  | 0                | 8                             | 0                                | 0                                 | 2                         |
| <b>Total</b>     | <b>56</b>             | <b>1</b>           | <b>0</b>         | <b>50</b>                     | <b>0</b>                         | <b>0</b>                          | <b>5</b>                  |

**Table A D.2. School participation status: survey of teachers – Malta, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| State            | 24                    | 1                  | 0                | 21                            | 0                                | 0                                 | 2                         |
| Church           | 22                    | 0                  | 0                | 20                            | 0                                | 0                                 | 2                         |
| Independent      | 10                    | 0                  | 0                | 7                             | 0                                | 0                                 | 3                         |
| <b>Total</b>     | <b>56</b>             | <b>1</b>           | <b>0</b>         | <b>48</b>                     | <b>0</b>                         | <b>0</b>                          | <b>7</b>                  |

**Table A D.3. Teacher participation status – Malta, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 263        |
| Absent                  | 518          |
| Left school permanently | 10           |
| Not part of sample      | 10           |
| <b>Total</b>            | <b>2 801</b> |

### Montenegro: ISCED level 2

ISCED level 2 in Montenegro consists of “Lower secondary school – higher grades (VI-IX)” and comprises Grades 6 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Census.

*Sample sizes:* All 162 schools were asked to participate in the main survey.

*Method of sample selection:* Census.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by region with three categories (central, north, south) and urbanisation with three categories (urban, suburban, rural).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education, Science, Culture and Sports and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Montenegro, ISCED level 2**

| Explicit stratum   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Central – Urban    | 21                    | 0                  | 0                | 11                            | 0                                | 0                                 | 10                        |
| Central – Suburban | 10                    | 0                  | 0                | 8                             | 0                                | 0                                 | 2                         |
| Central – Rural    | 28                    | 0                  | 0                | 22                            | 0                                | 0                                 | 6                         |
| North – Urban      | 20                    | 0                  | 0                | 18                            | 0                                | 0                                 | 2                         |
| North – Suburban   | 3                     | 0                  | 0                | 2                             | 0                                | 0                                 | 1                         |
| North – Rural      | 52                    | 1                  | 0                | 43                            | 0                                | 0                                 | 8                         |
| South – Urban      | 11                    | 0                  | 0                | 10                            | 0                                | 0                                 | 1                         |
| South – Suburban   | 12                    | 0                  | 0                | 11                            | 0                                | 0                                 | 1                         |
| South – Rural      | 5                     | 0                  | 0                | 5                             | 0                                | 0                                 | 0                         |
| <b>Total</b>       | <b>162</b>            | <b>1</b>           | <b>0</b>         | <b>130</b>                    | <b>0</b>                         | <b>0</b>                          | <b>31</b>                 |

**Table A D.2. School participation status: survey of teachers – Montenegro, ISCED level 2**

| Explicit stratum   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Central – Urban    | 21                    | 0                  | 0                | 12                            | 0                                | 0                                 | 9                         |
| Central – Suburban | 10                    | 0                  | 0                | 8                             | 0                                | 0                                 | 2                         |
| Central – Rural    | 28                    | 0                  | 0                | 23                            | 0                                | 0                                 | 5                         |
| North – Urban      | 20                    | 0                  | 0                | 15                            | 0                                | 0                                 | 5                         |
| North – Suburban   | 3                     | 0                  | 0                | 3                             | 0                                | 0                                 | 0                         |
| North – Rural      | 52                    | 1                  | 0                | 41                            | 0                                | 0                                 | 10                        |
| South – Urban      | 11                    | 0                  | 0                | 8                             | 0                                | 0                                 | 3                         |
| South – Suburban   | 12                    | 0                  | 0                | 11                            | 0                                | 0                                 | 1                         |
| South – Rural      | 5                     | 0                  | 0                | 5                             | 0                                | 0                                 | 0                         |
| <b>Total</b>       | <b>162</b>            | <b>1</b>           | <b>0</b>         | <b>126</b>                    | <b>0</b>                         | <b>0</b>                          | <b>35</b>                 |



Table A D.3. Teacher participation status – Montenegro, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 354        |
| Absent                  | 258          |
| Left school permanently | 5            |
| Not part of sample      | 6            |
| <b>Total</b>            | <b>1 623</b> |

## Morocco: ISCED level 2

ISCED level 2 in Morocco consists of “*Enseignement secondaire collegial*” and “*Formation professionnelle/spécialisation*” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between regions and between public and private schools.

*Sample sizes:* 33 schools were selected for the field trial; 400 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 2 only, ISCED levels 1 and 2), funding with two categories (public, private) and region with ten categories for public schools.

*Implicit stratification:* Organised by urbanisation with two categories (urban, rural).

*Data sources:* Data used for school sampling were obtained from the Ministry of National Education and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Morocco, ISCED level 2**

| Explicit stratum                                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public – Tanger-Tetouan-Al Hoceima | 32                    | 0                  | 0                | 32                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Oriental                  | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Fès-Meknès                | 40                    | 0                  | 0                | 40                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Rabat-Salé-Kénitra        | 42                    | 0                  | 0                | 42                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Béni Mellal-Khénifra      | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Casablanca-Settat         | 56                    | 0                  | 0                | 56                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Marrakech-Safi            | 44                    | 0                  | 0                | 44                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Drâa-Tafilalet            | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Souss-Massa               | 30                    | 1                  | 0                | 29                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – South                     | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Private                            | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Private                     | 28                    | 1                  | 0                | 26                            | 1                                | 0                                 | 0                         |
| <b>Total</b>                                      | <b>400</b>            | <b>2</b>           | <b>0</b>         | <b>397</b>                    | <b>1</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.2. School participation status: survey of teachers – Morocco, ISCED level 2**

| Explicit stratum                                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public – Tanger-Tetouan-Al Hoceima | 32                    | 0                  | 0                | 32                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Oriental                  | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Fès-Meknès                | 40                    | 0                  | 0                | 40                            | 0                                | 0                                 | 0                         |

| Explicit stratum                             | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public – Rabat-Salé-Kénitra   | 42                    | 0                  | 0                | 42                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Béni Mellal-Khénifra | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Casablanca-Settat    | 56                    | 0                  | 0                | 56                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Marrakech-Safi       | 44                    | 0                  | 0                | 44                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Drâa-Tafilalet       | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Souss-Massa          | 30                    | 1                  | 0                | 29                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – South                | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Private                       | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Private                | 28                    | 1                  | 0                | 26                            | 1                                | 0                                 | 0                         |
| <b>Total</b>                                 | <b>400</b>            | <b>2</b>           | <b>0</b>         | <b>397</b>                    | <b>1</b>                         | <b>0</b>                          | <b>0</b>                  |

Table A D.3. Teacher participation status – Morocco, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 6 112        |
| Absent                  | 106          |
| Left school permanently | 38           |
| Not part of sample      | 49           |
| <b>Total</b>            | <b>6 305</b> |

Table A D.4. School participation status: survey of teachers – Morocco, TK5

| Explicit stratum                                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public – Tanger-Tetouan-Al Hoceima | 32                    | 0                  | 0                | 32                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Oriental                  | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Fès-Meknès                | 40                    | 0                  | 0                | 40                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Rabat-Salé-Kénitra        | 42                    | 0                  | 0                | 42                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Béni Mellal-Khénifra      | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Casablanca-Settat         | 56                    | 0                  | 0                | 56                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Marrakech-Safi            | 44                    | 0                  | 0                | 44                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Drâa-Tafilalet            | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – Souss-Massa               | 30                    | 1                  | 0                | 29                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Public – South                     | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 2 only – Private                            | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Private                     | 28                    | 1                  | 0                | 26                            | 1                                | 0                                 | 0                         |
| <b>Total</b>                                      | <b>400</b>            | <b>2</b>           | <b>0</b>         | <b>397</b>                    | <b>1</b>                         | <b>0</b>                          | <b>0</b>                  |

Table A D.5. Teacher participation status – Morocco, TKS

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 584        |
| Absent                  | 72           |
| Left school permanently | 25           |
| Not part of sample      | 29           |
| <b>Total</b>            | <b>4 710</b> |

## Netherlands: ISCED level 2

The target population comprises the European Netherlands, not including the Dutch Caribbean.

ISCED level 2 in the Netherlands consists of “Vocational education: training to assistant level; (level 1); full-time school based and dual programmes”, “Practical training”, “Prevocational secondary education (including programmes with prevocational content, general content and mixed content)” and “Junior general secondary education (first three grades of senior general secondary education [HAVO] and pre university education [VWO] and combined classes)” and comprises Grades 7 to 9/10, counting from the first year of ISCED level 1 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to increase availability of replacement schools.

*Sample sizes:* 30 schools were selected for the field trial; 150 schools were selected for the main survey.

*Method of sample selection:* Three-stage sampling design. First 150 school organisations were selected, then 1 school location per school organisation. Systematic random sampling with equal probabilities on the first level, systematic random sampling with probabilities proportional to school size on the second level.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by educational track with three categories (academic, vocational, mixed).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Education Implementation Service of the Ministry of Education, Culture and Science and referred to 2021.

**Table A D.1. School participation status: survey of principals – Netherlands, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Academic         | 18                    | 0                  | 0                | 6                             | 3                                | 1                                 | 8                         |
| Vocational       | 20                    | 0                  | 0                | 11                            | 1                                | 0                                 | 8                         |
| Mixed            | 112                   | 1                  | 0                | 36                            | 14                               | 6                                 | 55                        |
| <b>Total</b>     | <b>150</b>            | <b>1</b>           | <b>0</b>         | <b>53</b>                     | <b>18</b>                        | <b>7</b>                          | <b>71</b>                 |

**Table A D.2. School participation status: survey of teachers – Netherlands, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Academic         | 18                    | 0                  | 0                | 5                             | 1                                | 1                                 | 11                        |
| Vocational       | 20                    | 0                  | 0                | 11                            | 2                                | 0                                 | 7                         |
| Mixed            | 112                   | 1                  | 0                | 40                            | 17                               | 7                                 | 47                        |
| <b>Total</b>     | <b>150</b>            | <b>1</b>           | <b>0</b>         | <b>56</b>                     | <b>20</b>                        | <b>8</b>                          | <b>65</b>                 |

**Table A D.3. Teacher participation status – Netherlands, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 271        |
| Absent                  | 454          |
| Left school permanently | 5            |
| Not part of sample      | 18           |
| <b>Total</b>            | <b>1 748</b> |

## New Zealand: ISCED level 2

The target population comprises New Zealand, not including the associated states Cook Islands and Niue or the dependent territory Tokelau.

ISCED level 2 in New Zealand consists of “Intermediate level education (Years 7-8)” and “Lower secondary education (Years 9-10)” and comprises Grades 7 to 10 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between school types and equity index levels.

*Sample sizes:* 36 schools were selected for the field trial; 230 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 2 only, ISCED levels 1 and 2), school type with four categories (intermediate, secondary, full primary, composite) and equity index level with three categories (low or unknown, medium, high). Due to low participation rates, strata were collapsed after the survey administration.

*Implicit stratification:* Organised by language with two categories (Māori language education, no Māori language education) and funding with two categories (public private).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2022/23.

**Table A D.1. School participation status: survey of principals – New Zealand, ISCED level 2**

| Explicit stratum                   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Intermediate        | 28                    | 1                  | 0                | 9                             | 8                                | 1                                 | 9                         |
| ISCED 2 only – Secondary           | 146                   | 0                  | 0                | 35                            | 12                               | 0                                 | 99                        |
| ISCED 1 and ISCED 2 – Full primary | 28                    | 0                  | 0                | 9                             | 7                                | 1                                 | 11                        |
| ISCED 1 and ISCED 2 – Composite    | 28                    | 0                  | 0                | 6                             | 2                                | 0                                 | 20                        |
| <b>Total</b>                       | <b>230</b>            | <b>1</b>           | <b>0</b>         | <b>59</b>                     | <b>29</b>                        | <b>2</b>                          | <b>139</b>                |

**Table A D.2. School participation status: survey of teachers – New Zealand, ISCED level 2**

| Explicit stratum                   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Intermediate        | 28                    | 1                  | 0                | 7                             | 7                                | 1                                 | 12                        |
| ISCED 2 only – Secondary           | 146                   | 0                  | 0                | 41                            | 19                               | 0                                 | 86                        |
| ISCED 1 and ISCED 2 – Full primary | 28                    | 3                  | 0                | 10                            | 5                                | 0                                 | 10                        |
| ISCED 1 and ISCED 2 – Composite    | 28                    | 0                  | 0                | 5                             | 2                                | 0                                 | 21                        |
| <b>Total</b>                       | <b>230</b>            | <b>4</b>           | <b>0</b>         | <b>63</b>                     | <b>33</b>                        | <b>1</b>                          | <b>129</b>                |

Table A D.3. Teacher participation status – New Zealand, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 204        |
| Absent                  | 475          |
| Left school permanently | 18           |
| Not part of sample      | 6            |
| <b>Total</b>            | <b>1 703</b> |

### North Macedonia: ISCED level 2

ISCED level 2 in North Macedonia consists of “Lower secondary education – regular” and comprises Grades 6 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 30 schools were selected for the field trial; 202 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by urbanisation with three categories (urban, mixed, rural).

*Implicit stratification:* Organised by language with three categories (Macedonian, mixed, Albanian).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and Science and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – North Macedonia, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Urban            | 92                    | 0                  | 0                | 92                            | 0                                | 0                                 | 0                         |
| Mixed            | 24                    | 0                  | 0                | 23                            | 0                                | 0                                 | 1                         |
| Rural            | 86                    | 0                  | 0                | 86                            | 0                                | 0                                 | 0                         |
| <b>Total</b>     | <b>202</b>            | <b>0</b>           | <b>0</b>         | <b>201</b>                    | <b>0</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.2. School participation status: survey of teachers – North Macedonia, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Urban            | 92                    | 0                  | 0                | 92                            | 0                                | 0                                 | 0                         |
| Mixed            | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Rural            | 86                    | 0                  | 0                | 86                            | 0                                | 0                                 | 0                         |
| <b>Total</b>     | <b>202</b>            | <b>0</b>           | <b>0</b>         | <b>202</b>                    | <b>0</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.3. Teacher participation status – North Macedonia, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 992        |
| Absent                  | 215          |
| Left school permanently | 45           |
| Not part of sample      | 43           |
| <b>Total</b>            | <b>4 295</b> |



### Norway: ISCED level 2

ISCED level 2 in Norway consists of “Lower secondary level” and comprises Grades 8 to 10 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 30 schools were selected for the field trial; 212 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 2 only, ISCED levels 1 and 2).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Primary and Secondary School Information System and referred to the school year 2021/22.

**Table A D.1. School participation status: survey of principals – Norway, ISCED level 2**

| Explicit stratum    | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only        | 142                   | 0                  | 0                | 69                            | 27                               | 9                                 | 37                        |
| ISCED 1 and ISCED 2 | 70                    | 1                  | 0                | 25                            | 10                               | 7                                 | 27                        |
| <b>Total</b>        | <b>212</b>            | <b>1</b>           | <b>0</b>         | <b>94</b>                     | <b>37</b>                        | <b>16</b>                         | <b>64</b>                 |

**Table A D.2. School participation status: survey of teachers – Norway, ISCED level 2**

| Explicit stratum    | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only        | 142                   | 0                  | 0                | 55                            | 25                               | 5                                 | 57                        |
| ISCED 1 and ISCED 2 | 70                    | 1                  | 0                | 16                            | 10                               | 1                                 | 42                        |
| <b>Total</b>        | <b>212</b>            | <b>1</b>           | <b>0</b>         | <b>71</b>                     | <b>35</b>                        | <b>6</b>                          | <b>99</b>                 |

**Table A D.3. Teacher participation status – Norway, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 528        |
| Absent                  | 550          |
| Left school permanently | 7            |
| Not part of sample      | 14           |
| <b>Total</b>            | <b>2 099</b> |

### Poland: ISCED level 2

ISCED level 2 in Poland consists of “General primary 1<sup>st</sup> level music school (grades 5-8)”, “Primary school for children and youth (grades 5-8)” and “Primary sports and sports masterclass school for youth (grades 5-8)” and comprises Grades 5 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to increase the number of big schools.

*Sample sizes:* 30 schools were selected for the field trial; 280 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by urbanisation with three categories (urban above 100 000 inhabitants, urban below 100 000 inhabitants, rural) and size with two categories (small, big).

*Implicit stratification:* Organised by urbanisation with six categories (capital city, big cities, towns, towns in urban-rural areas, villages in urban-rural areas, villages).

*Data sources:* Data used for school sampling were obtained from the Educational Information System and referred to school year 2022/23.

**Table A D.1. School participation status: survey of principals – Poland, ISCED level 2**

| Explicit stratum                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Urban above 100 000 inhabitants – Small | 32                    | 0                  | 0                | 27                            | 2                                | 3                                 | 0                         |
| Urban above 100 000 inhabitants – Big   | 46                    | 0                  | 0                | 43                            | 3                                | 0                                 | 0                         |
| Urban below 100 000 inhabitants – Small | 46                    | 0                  | 0                | 43                            | 2                                | 0                                 | 1                         |
| Urban below 100 000 inhabitants – Big   | 54                    | 0                  | 0                | 51                            | 3                                | 0                                 | 0                         |
| Rural – Small                           | 92                    | 0                  | 0                | 88                            | 4                                | 0                                 | 0                         |
| Rural – Big                             | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                            | <b>280</b>            | <b>0</b>           | <b>0</b>         | <b>262</b>                    | <b>14</b>                        | <b>3</b>                          | <b>1</b>                  |

**Table A D.2. School participation status: survey of teachers – Poland, ISCED level 2**

| Explicit stratum                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Urban above 100 000 inhabitants – Small | 32                    | 0                  | 0                | 27                            | 2                                | 3                                 | 0                         |
| Urban above 100 000 inhabitants – Big   | 46                    | 0                  | 0                | 43                            | 3                                | 0                                 | 0                         |
| Urban below 100 000 inhabitants – Small | 46                    | 0                  | 0                | 43                            | 2                                | 0                                 | 1                         |
| Urban below 100 000 inhabitants – Big   | 54                    | 0                  | 0                | 51                            | 3                                | 0                                 | 0                         |
| Rural – Small                           | 92                    | 0                  | 0                | 88                            | 4                                | 0                                 | 0                         |
| Rural – Big                             | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                            | <b>280</b>            | <b>0</b>           | <b>0</b>         | <b>262</b>                    | <b>14</b>                        | <b>3</b>                          | <b>1</b>                  |

Table A D.3. Teacher participation status – Poland, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 783        |
| Absent                  | 211          |
| Left school permanently | 12           |
| Not part of sample      | 3            |
| <b>Total</b>            | <b>4 009</b> |

Table A D.4. School participation status: survey of teachers – Poland, TKS

| Explicit stratum                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Urban above 100 000 inhabitants – Small | 32                    | 0                  | 0                | 27                            | 2                                | 3                                 | 0                         |
| Urban above 100 000 inhabitants – Big   | 46                    | 0                  | 0                | 43                            | 3                                | 0                                 | 0                         |
| Urban below 100 000 inhabitants – Small | 46                    | 0                  | 0                | 43                            | 2                                | 0                                 | 1                         |
| Urban below 100 000 inhabitants – Big   | 54                    | 0                  | 0                | 51                            | 3                                | 0                                 | 0                         |
| Rural – Small                           | 92                    | 0                  | 0                | 88                            | 4                                | 0                                 | 0                         |
| Rural – Big                             | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                            | <b>280</b>            | <b>0</b>           | <b>0</b>         | <b>262</b>                    | <b>14</b>                        | <b>3</b>                          | <b>1</b>                  |

Table A D.5. Teacher participation status – Poland, TKS

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 831        |
| Absent                  | 156          |
| Left school permanently | 10           |
| Not part of sample      | 5            |
| <b>Total</b>            | <b>3 002</b> |

### Portugal: ISCED level 2

The target population comprises mainland Portugal, not including the Azores and Madeira.

ISCED level 2 in Portugal consists of “Lower secondary education – Regular”, “Lower secondary education – Specialised artistic courses”, “Lower secondary education – Vocational courses”, “Lower secondary education – Education and training courses – Type 2” and “Lower secondary education – Education and training courses – Type 3” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between public and private schools.

*Sample sizes:* 32 schools were selected for the field trial; 230 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 2 only, ISCED levels 2 and 3) and funding with two categories (public, private).

*Implicit stratification:* Organised by region with five categories (Alentejo, Algarve, Centre, Lisbon, North) for public schools.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2019/20.

**Table A D.1. School participation status: survey of principals – Portugal, ISCED level 2**

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public         | 94                    | 0                  | 0                | 93                            | 1                                | 0                                 | 0                         |
| ISCED 2 only – Private        | 10                    | 1                  | 0                | 9                             | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Public  | 106                   | 2                  | 0                | 103                           | 0                                | 0                                 | 1                         |
| ISCED 2 and ISCED 3 – Private | 20                    | 1                  | 0                | 18                            | 0                                | 0                                 | 1                         |
| <b>Total</b>                  | <b>230</b>            | <b>4</b>           | <b>0</b>         | <b>223</b>                    | <b>1</b>                         | <b>0</b>                          | <b>2</b>                  |

**Table A D.2. School participation status: survey of teachers – Portugal, ISCED level 2**

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public         | 94                    | 0                  | 0                | 93                            | 1                                | 0                                 | 0                         |
| ISCED 2 only – Private        | 10                    | 1                  | 0                | 9                             | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Public  | 106                   | 2                  | 0                | 103                           | 0                                | 0                                 | 1                         |
| ISCED 2 and ISCED 3 – Private | 20                    | 1                  | 0                | 18                            | 0                                | 0                                 | 1                         |
| <b>Total</b>                  | <b>230</b>            | <b>4</b>           | <b>0</b>         | <b>223</b>                    | <b>1</b>                         | <b>0</b>                          | <b>2</b>                  |

Table A D.3. Teacher participation status – Portugal, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 511        |
| Absent                  | 296          |
| Left school permanently | 27           |
| Not part of sample      | 107          |
| <b>Total</b>            | <b>3 941</b> |

Table A D.4. School participation status: survey of teachers – Portugal, TKS

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Public         | 94                    | 0                  | 0                | 93                            | 1                                | 0                                 | 0                         |
| ISCED 2 only – Private        | 10                    | 1                  | 0                | 9                             | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Public  | 106                   | 2                  | 0                | 103                           | 0                                | 0                                 | 1                         |
| ISCED 2 and ISCED 3 – Private | 20                    | 1                  | 0                | 18                            | 0                                | 0                                 | 1                         |
| <b>Total</b>                  | <b>230</b>            | <b>4</b>           | <b>0</b>         | <b>223</b>                    | <b>1</b>                         | <b>0</b>                          | <b>2</b>                  |

Table A D.5. Teacher participation status – Portugal, TKS

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 634        |
| Absent                  | 242          |
| Left school permanently | 16           |
| Not part of sample      | 60           |
| <b>Total</b>            | <b>2 952</b> |

### Romania: ISCED level 2

ISCED level 2 in Romania consists of “Lower secondary – gymnasium” and comprises Grades 6 to 9, counting from the first year of ISCED level 1 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 students.

*Sample sizes:* 30 schools were selected for the field trial; 216 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by urbanisation with two categories (urban, rural).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and Research and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Romania, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Urban            | 126                   | 0                  | 0                | 126                           | 0                                | 0                                 | 0                         |
| Rural            | 90                    | 0                  | 0                | 90                            | 0                                | 0                                 | 0                         |
| <b>Total</b>     | <b>216</b>            | <b>0</b>           | <b>0</b>         | <b>216</b>                    | <b>0</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.2. School participation status: survey of teachers – Romania, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Urban            | 126                   | 0                  | 0                | 126                           | 0                                | 0                                 | 0                         |
| Rural            | 90                    | 0                  | 0                | 90                            | 0                                | 0                                 | 0                         |
| <b>Total</b>     | <b>216</b>            | <b>0</b>           | <b>0</b>         | <b>216</b>                    | <b>0</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.3. Teacher participation status – Romania, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 873        |
| Absent                  | 102          |
| Left school permanently | 13           |
| Not part of sample      | 11           |
| <b>Total</b>            | <b>3 999</b> |

### Saudi Arabia: ISCED level 2

ISCED level 2 in Saudi Arabia consists of “Intermediate education” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between public, private and international schools.

*Sample sizes:* 36 schools were selected for the field trial; 342 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by school type with three categories (public, private, international), gender with two categories (female, male) and region with two categories (region not excluded in 2018, region excluded in 2018) for public schools.

*Implicit stratification:* Organised by region with 13 categories.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to 2022.

**Table A D.1. School participation status: survey of principals – Saudi Arabia, ISCED level 2**

| Explicit stratum                              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Female – Region not excluded in 2018 | 126                   | 2                  | 0                | 117                           | 0                                | 0                                 | 7                         |
| Public – Female – Region excluded in 2018     | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Public – Male – Region not excluded in 2018   | 130                   | 2                  | 0                | 126                           | 0                                | 0                                 | 2                         |
| Public – Male – Region excluded in 2018       | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Private – Female                              | 12                    | 1                  | 0                | 11                            | 0                                | 0                                 | 0                         |
| Private – Male                                | 18                    | 1                  | 0                | 15                            | 0                                | 0                                 | 2                         |
| International – Female                        | 16                    | 2                  | 0                | 11                            | 0                                | 0                                 | 3                         |
| International – Male                          | 14                    | 0                  | 0                | 13                            | 0                                | 0                                 | 1                         |
| <b>Total</b>                                  | <b>342</b>            | <b>8</b>           | <b>0</b>         | <b>319</b>                    | <b>0</b>                         | <b>0</b>                          | <b>15</b>                 |

**Table A D.2. School participation status: survey of teachers – Saudi Arabia, ISCED level 2**

| Explicit stratum                              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Female – Region not excluded in 2018 | 126                   | 2                  | 0                | 122                           | 0                                | 0                                 | 2                         |
| Public – Female – Region excluded in 2018     | 12                    | 0                  | 0                | 11                            | 0                                | 0                                 | 1                         |
| Public – Male – Region not excluded in 2018   | 130                   | 2                  | 0                | 127                           | 0                                | 0                                 | 1                         |
| Public – Male – Region excluded in 2018       | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Private – Female                              | 12                    | 1                  | 0                | 10                            | 0                                | 0                                 | 1                         |

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Private – Male         | 18                    | 1                  | 0                | 17                            | 0                                | 0                                 | 0                         |
| International – Female | 16                    | 2                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| International – Male   | 14                    | 0                  | 0                | 11                            | 0                                | 0                                 | 3                         |
| <b>Total</b>           | <b>342</b>            | <b>8</b>           | <b>0</b>         | <b>326</b>                    | <b>0</b>                         | <b>0</b>                          | <b>8</b>                  |

Table A D.3. Teacher participation status – Saudi Arabia, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 306        |
| Absent                  | 202          |
| Left school permanently | 62           |
| Not part of sample      | 10           |
| <b>Total</b>            | <b>3 580</b> |

Table A D.4. School participation status: survey of teachers – Saudi Arabia, TKS

| Explicit stratum                              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Female – Region not excluded in 2018 | 126                   | 2                  | 0                | 124                           | 0                                | 0                                 | 0                         |
| Public – Female – Region excluded in 2018     | 12                    | 0                  | 0                | 11                            | 0                                | 0                                 | 1                         |
| Public – Male – Region not excluded in 2018   | 130                   | 2                  | 0                | 126                           | 0                                | 0                                 | 2                         |
| Public – Male – Region excluded in 2018       | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Private – Female                              | 11                    | 1                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Private – Male                                | 18                    | 1                  | 0                | 17                            | 0                                | 0                                 | 0                         |
| International – Female                        | 13                    | 2                  | 0                | 10                            | 0                                | 0                                 | 1                         |
| International – Male                          | 13                    | 0                  | 0                | 12                            | 0                                | 0                                 | 1                         |
| <b>Total</b>                                  | <b>337</b>            | <b>8</b>           | <b>0</b>         | <b>324</b>                    | <b>0</b>                         | <b>0</b>                          | <b>5</b>                  |

Table A D.5. Teacher participation status – Saudi Arabia, TKS

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 435        |
| Absent                  | 170          |
| Left school permanently | 48           |
| Not part of sample      | 4            |
| <b>Total</b>            | <b>2 657</b> |



### Serbia: ISCED level 2

ISCED level 2 in Serbia consists of “Elementary school – second cycle (V-VIII grade)” and “Secondary musical education” and comprises Grades 5 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 30 schools were selected for the field trial; 200 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by region with three categories (Belgrade, Central Serbia, Vojvodina).

*Implicit stratification:* Organised by urbanisation with two categories (urban, rural).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education, Science and Technological Development and referred to school year 2019/20.

**Table A D.1. School participation status: survey of principals – Serbia, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Belgrade         | 34                    | 0                  | 0                | 32                            | 2                                | 0                                 | 0                         |
| Central Serbia   | 110                   | 0                  | 0                | 110                           | 0                                | 0                                 | 0                         |
| Vojvodina        | 56                    | 0                  | 0                | 55                            | 0                                | 0                                 | 1                         |
| <b>Total</b>     | <b>200</b>            | <b>0</b>           | <b>0</b>         | <b>197</b>                    | <b>2</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.2. School participation status: survey of teachers – Serbia, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Belgrade         | 34                    | 0                  | 0                | 32                            | 2                                | 0                                 | 0                         |
| Central Serbia   | 110                   | 0                  | 0                | 110                           | 0                                | 0                                 | 0                         |
| Vojvodina        | 56                    | 0                  | 0                | 55                            | 0                                | 0                                 | 1                         |
| <b>Total</b>     | <b>200</b>            | <b>0</b>           | <b>0</b>         | <b>197</b>                    | <b>2</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.3. Teacher participation status – Serbia, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 007        |
| Absent                  | 183          |
| Left school permanently | 27           |
| Not part of sample      | 10           |
| <b>Total</b>            | <b>4 227</b> |

### Shanghai (China): ISCED level 2

ISCED level 2 in the People's Republic of China (hereafter China) consists of “Junior secondary education” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between public and private schools.

*Sample sizes:* 30 schools were selected for the field trial; 208 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by funding with two categories (public, private) and urbanisation with two categories (urban, suburban).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Shanghai Municipal Education Commission and referred to 2022.

**Table A D.1. School participation status: survey of principals – Shanghai (China), ISCED level 2**

| Explicit stratum   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Urban     | 58                    | 2                  | 0                | 56                            | 0                                | 0                                 | 0                         |
| Public – Suburban  | 116                   | 0                  | 0                | 116                           | 0                                | 0                                 | 0                         |
| Private – Urban    | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Private – Suburban | 22                    | 1                  | 0                | 21                            | 0                                | 0                                 | 0                         |
| <b>Total</b>       | <b>208</b>            | <b>3</b>           | <b>0</b>         | <b>205</b>                    | <b>0</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.2. School participation status: survey of teachers – Shanghai (China), ISCED level 2**

| Explicit stratum   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Urban     | 58                    | 2                  | 0                | 56                            | 0                                | 0                                 | 0                         |
| Public – Suburban  | 116                   | 0                  | 0                | 116                           | 0                                | 0                                 | 0                         |
| Private – Urban    | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Private – Suburban | 22                    | 1                  | 0                | 21                            | 0                                | 0                                 | 0                         |
| <b>Total</b>       | <b>208</b>            | <b>3</b>           | <b>0</b>         | <b>205</b>                    | <b>0</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.3. Teacher participation status – Shanghai (China), ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 078        |
| Absent                  | 67           |
| Left school permanently | 3            |
| Not part of sample      | 2            |
| <b>Total</b>            | <b>4 150</b> |

### Singapore: ISCED level 2

ISCED level 2 in Singapore consists of “Secondary 1-2 – common to express and normal (academic or technical) course” and comprises Grades 7 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Census for public schools, sample of private schools.

*Sample sizes:* 15 schools were selected for the field trial; 159 schools were selected for the main survey.

*Method of sample selection:* Census for public schools and systematic random sampling with selection probabilities proportional to school size for private schools.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by funding with two categories (public, private).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Singapore, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public           | 146                   | 1                  | 0                | 144                           | 0                                | 0                                 | 1                         |
| Private          | 14                    | 0                  | 0                | 8                             | 2                                | 0                                 | 4                         |
| <b>Total</b>     | <b>160</b>            | <b>1</b>           | <b>0</b>         | <b>152</b>                    | <b>2</b>                         | <b>0</b>                          | <b>5</b>                  |

**Table A D.2. School participation status: survey of teachers – Singapore, ISCED level 2**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public           | 146                   | 1                  | 0                | 145                           | 0                                | 0                                 | 0                         |
| Private          | 14                    | 0                  | 0                | 9                             | 2                                | 0                                 | 3                         |
| <b>Total</b>     | <b>160</b>            | <b>1</b>           | <b>0</b>         | <b>154</b>                    | <b>2</b>                         | <b>0</b>                          | <b>3</b>                  |

**Table A D.3. Teacher participation status – Singapore, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 355        |
| Absent                  | 98           |
| Left school permanently | 50           |
| Not part of sample      | 71           |
| <b>Total</b>            | <b>3 574</b> |

### **Slovak Republic: ISCED level 2**

ISCED level 2 in the Slovak Republic consists of “Basic school – 2<sup>nd</sup> stage”, “Practical school”, “Courses for complementing of lower secondary education”, “Gymnasium – 8 years, grades 1-4” and “Dance conservatoire – 8 years, grades 1-4” and comprises Grades 5 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of teachers in ISCED level 2 schools.

*Sample sizes:* 30 schools were selected for the field trial; 242 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of teachers in ISCED level 2 schools.

*Explicit stratification:* Organised by school type with two categories (primary school, grammar school) and urbanisation with two categories (urban, rural).

*Implicit stratification:* Organised by region with eight categories (Banská Bratislava Region, Bystrica Region, Košice Region, Nitra Region, Prešov Region, Trenčín Region, Trnava Region, Žilina Region) and funding with two categories (public, private).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education, Research, Development and Youth and the Slovak Centre of Scientific and Technical Information and referred to 2022.

**Table A D.1. School participation status: survey of principals – Slovak Republic, ISCED level 2**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Primary school – Urban | 126                   | 0                  | 0                | 121                           | 2                                | 0                                 | 3                         |
| Primary school – Rural | 88                    | 0                  | 0                | 83                            | 5                                | 0                                 | 0                         |
| Grammar school – Urban | 28                    | 0                  | 0                | 28                            | 0                                | 0                                 | 0                         |
| <b>Total</b>           | <b>242</b>            | <b>0</b>           | <b>0</b>         | <b>232</b>                    | <b>7</b>                         | <b>0</b>                          | <b>3</b>                  |

**Table A D.2. School participation status: survey of teachers – Slovak Republic, ISCED level 2**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Primary school – Urban | 126                   | 0                  | 0                | 124                           | 2                                | 0                                 | 0                         |
| Primary school – Rural | 88                    | 0                  | 0                | 83                            | 5                                | 0                                 | 0                         |
| Grammar school – Urban | 28                    | 0                  | 0                | 28                            | 0                                | 0                                 | 0                         |
| <b>Total</b>           | <b>242</b>            | <b>0</b>           | <b>0</b>         | <b>235</b>                    | <b>7</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.3. Teacher participation status – Slovak Republic, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 190        |
| Absent                  | 168          |
| Left school permanently | 33           |
| Not part of sample      | 57           |
| <b>Total</b>            | <b>4 448</b> |

### Slovenia: ISCED level 2

ISCED level 2 in Slovenia consists of “Basic education (grades 7-9)” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to reduce the number of big schools in the sample for overlap control.

*Sample sizes:* 30 schools were selected for the field trial; 264 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with equal probabilities for big schools; otherwise, systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by regions with four categories (northeast, southeast, central, west) and school size with two categories (big, small) for central, southeast and western regions.

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education, Science and Sport and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Slovenia, ISCED level 2**

| Explicit stratum          | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Northeast                 | 62                    | 0                  | 0                | 54                            | 0                                | 0                                 | 8                         |
| Southeast – Big schools   | 12                    | 0                  | 0                | 8                             | 0                                | 0                                 | 4                         |
| Southeast – Small schools | 52                    | 0                  | 0                | 37                            | 3                                | 0                                 | 12                        |
| Central – Big schools     | 36                    | 0                  | 0                | 26                            | 0                                | 0                                 | 10                        |
| Central – Small schools   | 39                    | 0                  | 0                | 30                            | 0                                | 0                                 | 9                         |
| West – Big schools        | 25                    | 0                  | 0                | 21                            | 0                                | 0                                 | 4                         |
| West – Small schools      | 38                    | 0                  | 0                | 28                            | 0                                | 0                                 | 10                        |
| <b>Total</b>              | <b>264</b>            | <b>0</b>           | <b>0</b>         | <b>204</b>                    | <b>3</b>                         | <b>0</b>                          | <b>57</b>                 |

**Table A D.2. School participation status: survey of teachers – Slovenia, ISCED level 2**

| Explicit stratum          | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Northeast                 | 62                    | 0                  | 0                | 54                            | 0                                | 0                                 | 8                         |
| Southeast – Big schools   | 12                    | 0                  | 0                | 11                            | 0                                | 0                                 | 1                         |
| Southeast – Small schools | 52                    | 0                  | 0                | 38                            | 3                                | 0                                 | 11                        |
| Central – Big schools     | 36                    | 0                  | 0                | 30                            | 0                                | 0                                 | 6                         |
| Central – Small schools   | 39                    | 0                  | 0                | 33                            | 0                                | 0                                 | 6                         |
| West – Big schools        | 25                    | 0                  | 0                | 21                            | 0                                | 0                                 | 4                         |
| West – Small schools      | 38                    | 0                  | 0                | 32                            | 0                                | 0                                 | 6                         |
| <b>Total</b>              | <b>264</b>            | <b>0</b>           | <b>0</b>         | <b>219</b>                    | <b>3</b>                         | <b>0</b>                          | <b>42</b>                 |

Table A D.3. Teacher participation status – Slovenia, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 831        |
| Absent                  | 357          |
| Left school permanently | 13           |
| Not part of sample      | 4            |
| <b>Total</b>            | <b>3 205</b> |

### South Africa: ISCED level 2

ISCED level 2 in South Africa consists of “Lower secondary education (Grades 8 to 9)” and comprises Grades 8 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between provinces and between public and private schools.

*Sample sizes:* 31 schools were selected for the field trial; 401 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of teachers in ISCED level 2 schools.

*Explicit stratification:* Organised by funding with two categories (public, private) and provinces with nine categories (Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, North West, Western Cape) within public schools.

*Implicit stratification:* Organised by provinces with nine categories (Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, North West, Western Cape) and urbanisation with three categories (urban, unknown, rural) for public schools.

*Data sources:* Data used for school sampling were obtained from the Education Management Information System and referred to 2021.

**Table A D.1. School participation status: survey of principals – South Africa, ISCED level 2**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Eastern Cape  | 46                    | 3                  | 0                | 36                            | 0                                | 0                                 | 7                         |
| Public – Free State    | 30                    | 2                  | 0                | 21                            | 0                                | 0                                 | 7                         |
| Public – Gauteng       | 46                    | 0                  | 0                | 35                            | 0                                | 0                                 | 11                        |
| Public – KwaZulu-Natal | 74                    | 3                  | 0                | 59                            | 0                                | 0                                 | 12                        |
| Public – Limpopo       | 38                    | 0                  | 0                | 37                            | 0                                | 0                                 | 1                         |
| Public – Mpumalanga    | 30                    | 3                  | 0                | 24                            | 0                                | 0                                 | 3                         |
| Public – Northern Cape | 30                    | 1                  | 0                | 20                            | 0                                | 0                                 | 9                         |
| Public – North West    | 30                    | 0                  | 0                | 24                            | 0                                | 0                                 | 6                         |
| Public – Western Cape  | 31                    | 1                  | 0                | 22                            | 0                                | 0                                 | 8                         |
| Private                | 46                    | 0                  | 0                | 38                            | 2                                | 0                                 | 6                         |
| <b>Total</b>           | <b>401</b>            | <b>13</b>          | <b>0</b>         | <b>316</b>                    | <b>2</b>                         | <b>0</b>                          | <b>70</b>                 |

**Table A D.2. School participation status: survey of teachers – South Africa, ISCED level 2**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Eastern Cape  | 46                    | 4                  | 0                | 41                            | 0                                | 0                                 | 1                         |
| Public – Free State    | 30                    | 2                  | 0                | 25                            | 0                                | 0                                 | 3                         |
| Public – Gauteng       | 46                    | 0                  | 0                | 44                            | 0                                | 0                                 | 2                         |
| Public – KwaZulu-Natal | 74                    | 3                  | 0                | 60                            | 0                                | 0                                 | 11                        |
| Public – Limpopo       | 38                    | 0                  | 0                | 38                            | 0                                | 0                                 | 0                         |
| Public – Mpumalanga    | 30                    | 3                  | 0                | 26                            | 0                                | 0                                 | 1                         |
| Public – Northern Cape | 30                    | 1                  | 0                | 27                            | 0                                | 0                                 | 2                         |

| Explicit stratum      | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – North West   | 30                    | 0                  | 0                | 29                            | 0                                | 0                                 | 1                         |
| Public – Western Cape | 31                    | 1                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Private               | 46                    | 0                  | 0                | 39                            | 2                                | 0                                 | 5                         |
| <b>Total</b>          | <b>401</b>            | <b>14</b>          | <b>0</b>         | <b>359</b>                    | <b>2</b>                         | <b>0</b>                          | <b>26</b>                 |

Table A D.3. Teacher participation status – South Africa, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 301        |
| Absent                  | 320          |
| Left school permanently | 91           |
| Not part of sample      | 100          |
| <b>Total</b>            | <b>3 812</b> |

Table A D.4. School participation status: survey of teachers – South Africa, TKS

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Eastern Cape  | 46                    | 4                  | 0                | 39                            | 0                                | 0                                 | 3                         |
| Public – Free State    | 30                    | 2                  | 0                | 25                            | 0                                | 0                                 | 3                         |
| Public – Gauteng       | 46                    | 0                  | 0                | 44                            | 0                                | 0                                 | 2                         |
| Public – KwaZulu-Natal | 74                    | 3                  | 0                | 61                            | 0                                | 0                                 | 10                        |
| Public – Limpopo       | 38                    | 0                  | 0                | 38                            | 0                                | 0                                 | 0                         |
| Public – Mpumalanga    | 30                    | 3                  | 0                | 27                            | 0                                | 0                                 | 0                         |
| Public – Northern Cape | 30                    | 1                  | 0                | 28                            | 0                                | 0                                 | 1                         |
| Public – North West    | 29                    | 0                  | 0                | 27                            | 0                                | 0                                 | 2                         |
| Public – Western Cape  | 31                    | 1                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Private                | 45                    | 0                  | 0                | 38                            | 2                                | 0                                 | 5                         |
| <b>Total</b>           | <b>399</b>            | <b>14</b>          | <b>0</b>         | <b>357</b>                    | <b>2</b>                         | <b>0</b>                          | <b>26</b>                 |

Table A D.5. Teacher participation status – South Africa, TKS

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 376        |
| Absent                  | 222          |
| Left school permanently | 58           |
| Not part of sample      | 64           |
| <b>Total</b>            | <b>2 720</b> |



### Spain: ISCED level 2

ISCED level 2 in Spain consists of “Compulsory lower secondary education” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between some of the communities.

*Sample sizes:* 30 schools were selected for the field trial; 507 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by community with 18 categories, funding with two categories (public, private) for Andalusia, Asturias, Balearic Islands, Canary Islands, Catalonia and Valencian Community, and overlap with two categories (with ISCED level 1, without ISCED level 1) for Cantabria and La Rioja.

*Implicit stratification:* Organised by funding with two categories (public, private).

*Data sources:* Data used for school sampling were obtained from the autonomous communities and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Spain, ISCED level 2**

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Andalusia – Public            | 40                    | 0                  | 0                | 38                            | 0                                | 0                                 | 2                         |
| Andalusia – Private           | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Aragon                        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Asturias – Public             | 38                    | 0                  | 0                | 38                            | 0                                | 0                                 | 0                         |
| Asturias – Private            | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Balearic Islands – Public     | 36                    | 0                  | 0                | 36                            | 0                                | 0                                 | 0                         |
| Balearic Islands – Private    | 15                    | 0                  | 0                | 15                            | 0                                | 0                                 | 0                         |
| Basque Country                | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Canary Islands – Public       | 42                    | 0                  | 0                | 36                            | 0                                | 0                                 | 6                         |
| Canary Islands – Private      | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Cantabria – With ISCED 1      | 14                    | 0                  | 0                | 13                            | 0                                | 0                                 | 1                         |
| Cantabria – Without ISCED 1   | 36                    | 0                  | 0                | 35                            | 0                                | 0                                 | 1                         |
| Castile and Leon              | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Castilla-La Mancha            | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Catalonia – Public            | 38                    | 0                  | 0                | 37                            | 1                                | 0                                 | 0                         |
| Catalonia – Privat            | 12                    | 0                  | 0                | 11                            | 0                                | 0                                 | 1                         |
| Community of Madrid           | 26                    | 0                  | 0                | 26                            | 0                                | 0                                 | 0                         |
| Ceuta/Melilla                 | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Extremadura                   | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Galicia                       | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| La Rioja – With ISCED 1       | 21                    | 0                  | 0                | 21                            | 0                                | 0                                 | 0                         |
| La Rioja – Without ISCED 1    | 29                    | 0                  | 0                | 29                            | 0                                | 0                                 | 0                         |
| Navarre                       | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Region of Murcia              | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Valencian Community – Public  | 38                    | 0                  | 0                | 38                            | 0                                | 0                                 | 0                         |
| Valencian Community – Private | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                  | <b>507</b>            | <b>0</b>           | <b>0</b>         | <b>493</b>                    | <b>1</b>                         | <b>0</b>                          | <b>13</b>                 |

Table A D.2. School participation status: survey of teachers – Spain, ISCED level 2

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Andalusia – Public            | 40                    | 0                  | 0                | 40                            | 0                                | 0                                 | 0                         |
| Andalusia – Private           | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Aragon                        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Asturias – Public             | 38                    | 0                  | 0                | 38                            | 0                                | 0                                 | 0                         |
| Asturias – Private            | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Balearic Islands – Public     | 36                    | 0                  | 0                | 36                            | 0                                | 0                                 | 0                         |
| Balearic Islands – Private    | 15                    | 0                  | 0                | 15                            | 0                                | 0                                 | 0                         |
| Basque Country                | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Canary Islands – Public       | 42                    | 0                  | 0                | 42                            | 0                                | 0                                 | 0                         |
| Canary Islands – Private      | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Cantabria – With ISCED 1      | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Cantabria – Without ISCED 1   | 36                    | 0                  | 0                | 36                            | 0                                | 0                                 | 0                         |
| Castile and Leon              | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Castilla-La Mancha            | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Catalonia – Public            | 38                    | 0                  | 0                | 37                            | 1                                | 0                                 | 0                         |
| Catalonia – Privat            | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Community of Madrid           | 26                    | 0                  | 0                | 26                            | 0                                | 0                                 | 0                         |
| Ceuta/Melilla                 | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Extremadura                   | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Galicia                       | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| La Rioja – With ISCED 1       | 21                    | 0                  | 0                | 21                            | 0                                | 0                                 | 0                         |
| La Rioja – Without ISCED 1    | 29                    | 0                  | 0                | 29                            | 0                                | 0                                 | 0                         |
| Navarre                       | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Region of Murcia              | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Valencian Community – Public  | 38                    | 0                  | 0                | 38                            | 0                                | 0                                 | 0                         |
| Valencian Community – Private | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                  | <b>507</b>            | <b>0</b>           | <b>0</b>         | <b>506</b>                    | <b>1</b>                         | <b>0</b>                          | <b>0</b>                  |

Table A D.3. Teacher participation status – Spain, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 9 098        |
| Absent                  | 571          |
| Left school permanently | 40           |
| Not part of sample      | 174          |
| <b>Total</b>            | <b>9 883</b> |

### Sweden: ISCED level 2

ISCED level 2 in Sweden consists of “Compulsory school, grades 7-9” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 students.

*Sample sizes:* 30 schools were selected for the field trial; 210 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by overlap with two categories (preschool class and ISCED level 2 school, ISCED level 2 school) and funding with two categories (public, private).

*Implicit stratification:* Organised by urbanisation with three categories (metropolitan area, large cities, other areas) for ISCED 2 schools.

*Data sources:* Data used for school sampling were obtained from the Swedish National Agency for Education and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Sweden, ISCED level 2**

| Explicit stratum                             | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Preschool class and ISCED 2 school – Public  | 52                    | 1                  | 0                | 43                            | 2                                | 0                                 | 6                         |
| Preschool class and ISCED 2 school – Private | 18                    | 0                  | 0                | 14                            | 1                                | 0                                 | 3                         |
| ISCED 2 school – Public                      | 114                   | 1                  | 0                | 100                           | 1                                | 0                                 | 12                        |
| ISCED 2 school – Private                     | 26                    | 2                  | 0                | 21                            | 1                                | 0                                 | 2                         |
| <b>Total</b>                                 | <b>210</b>            | <b>4</b>           | <b>0</b>         | <b>178</b>                    | <b>5</b>                         | <b>0</b>                          | <b>23</b>                 |

**Table A D.2. School participation status: survey of teachers – Sweden, ISCED level 2**

| Explicit stratum                             | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Preschool class and ISCED 2 school – Public  | 52                    | 1                  | 0                | 47                            | 2                                | 0                                 | 2                         |
| Preschool class and ISCED 2 school – Private | 18                    | 0                  | 0                | 13                            | 1                                | 0                                 | 4                         |
| ISCED 2 school – Public                      | 114                   | 1                  | 0                | 109                           | 1                                | 0                                 | 3                         |
| ISCED 2 school – Private                     | 26                    | 2                  | 0                | 22                            | 1                                | 0                                 | 1                         |
| <b>Total</b>                                 | <b>210</b>            | <b>4</b>           | <b>0</b>         | <b>191</b>                    | <b>5</b>                         | <b>0</b>                          | <b>10</b>                 |

**Table A D.3. Teacher participation status – Sweden, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 065        |
| Absent                  | 949          |
| Left school permanently | 31           |
| Not part of sample      | 58           |
| <b>Total</b>            | <b>4 103</b> |

### Türkiye: ISCED level 2

ISCED level 2 in Türkiye consists of “Lower secondary education”, “Open lower secondary education”, “Music and ballet lower secondary school” and “Imam and preacher lower secondary school” and comprises Grades 5 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 33 schools were selected for the field trial; 230 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by funding with 2 categories (public, private) and region with 12 categories for public schools.

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of National Education and referred to school year 2022/2023.

**Table A D.1. School participation status: survey of principals – Türkiye, ISCED level 2**

| Explicit stratum                      | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Istanbul Region              | 24                    | 0                  | 0                | 22                            | 0                                | 0                                 | 2                         |
| Public – West Marmara Region          | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Aegean Region                | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Public – East Marmara Region          | 18                    | 0                  | 0                | 18                            | 0                                | 0                                 | 0                         |
| Public – West Anatolia Region         | 18                    | 0                  | 0                | 18                            | 0                                | 0                                 | 0                         |
| Public – Mediterranean Region         | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Public – Central Anatolia Region      | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Public – West Black Sea Region        | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Public – East Black Sea Region        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Northeast Anatolia Region    | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Central East Anatolia Region | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Public – Southeast Anatolia Region    | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Private                               | 24                    | 0                  | 0                | 22                            | 0                                | 0                                 | 2                         |
| <b>Total</b>                          | <b>230</b>            | <b>0</b>           | <b>0</b>         | <b>226</b>                    | <b>0</b>                         | <b>0</b>                          | <b>4</b>                  |

**Table A D.2. School participation status: survey of teachers – Türkiye, ISCED level 2**

| Explicit stratum                 | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Istanbul Region         | 24                    | 0                  | 0                | 23                            | 0                                | 0                                 | 1                         |
| Public – West Marmara Region     | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Aegean Region           | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Public – East Marmara Region     | 18                    | 0                  | 0                | 18                            | 0                                | 0                                 | 0                         |
| Public – West Anatolia Region    | 18                    | 0                  | 0                | 18                            | 0                                | 0                                 | 0                         |
| Public – Mediterranean Region    | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Public – Central Anatolia Region | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |

| Explicit stratum                      | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – West Black Sea Region        | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Public – East Black Sea Region        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Northeast Anatolia Region    | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Central East Anatolia Region | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Public – Southeast Anatolia Region    | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Private                               | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                          | <b>230</b>            | <b>0</b>           | <b>0</b>         | <b>229</b>                    | <b>0</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.3. Teacher participation status – Türkiye, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 932        |
| Absent                  | 140          |
| Left school permanently | 10           |
| Not part of sample      | 16           |
| <b>Total</b>            | <b>5 098</b> |

## United Arab Emirates: ISCED level 2

ISCED level 2 in the United Arab Emirates consists of “Second cycle of basic education” and comprises Grades 5 to 8 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to improve overlap control between ISCED levels.

*Sample sizes:* 30 schools were selected for the field trial; 218 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by overlap with four categories (ISCED level 2 only; ISCED levels 1 and 2; ISCED levels 2 and 3; ISCED levels 1, 2 and 3) and emirates with three categories (Abu Dhabi, Dubai, other emirates).

*Implicit stratification:* Organised by language with two categories (Arabic, English).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2023/24.

**Table A D.1. School participation status: survey of principals – United Arab Emirates, ISCED level 2**

| Explicit stratum                              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Abu Dhabi                      | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 2 only – Dubai                          | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 2 only – Other emirates                 | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Abu Dhabi               | 8                     | 2                  | 0                | 6                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Dubai                   | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Other emirates          | 16                    | 2                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Abu Dhabi               | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Dubai                   | 4                     | 0                  | 0                | 4                             | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Other emirates          | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1, ISCED 2 and ISCED 3 – Abu Dhabi      | 62                    | 1                  | 0                | 58                            | 0                                | 0                                 | 3                         |
| ISCED 1, ISCED 2 and ISCED 3 – Dubai          | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| ISCED 1, ISCED 2 and ISCED 3 – Other emirates | 54                    | 0                  | 0                | 54                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                                  | <b>218</b>            | <b>5</b>           | <b>0</b>         | <b>210</b>                    | <b>0</b>                         | <b>0</b>                          | <b>3</b>                  |

**Table A D.2. School participation status: survey of teachers – United Arab Emirates, ISCED level 2**

| Explicit stratum                | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 2 only – Abu Dhabi        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 2 only – Dubai            | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 2 only – Other emirates   | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Abu Dhabi | 8                     | 2                  | 0                | 6                             | 0                                | 0                                 | 0                         |

| Explicit stratum                              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 and ISCED 2 – Dubai                   | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Other emirates          | 16                    | 2                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Abu Dhabi               | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Dubai                   | 4                     | 0                  | 0                | 4                             | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Other emirates          | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1, ISCED 2 and ISCED 3 – Abu Dhabi      | 62                    | 1                  | 0                | 60                            | 0                                | 0                                 | 1                         |
| ISCED 1, ISCED 2 and ISCED 3 – Dubai          | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| ISCED 1, ISCED 2 and ISCED 3 – Other emirates | 54                    | 0                  | 0                | 54                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                                  | <b>218</b>            | <b>5</b>           | <b>0</b>         | <b>212</b>                    | <b>0</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.3. Teacher participation status – United Arab Emirates, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 369        |
| Absent                  | 73           |
| Left school permanently | 12           |
| Not part of sample      | 0            |
| <b>Total</b>            | <b>4 454</b> |

### United States: ISCED level 2

The target population comprises the 50 states and Washington, DC, not including the territories.

ISCED level 2 in United States consists of “Middle education (grades 7-9)” and comprises Grades 7 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 students; then adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 70 schools were selected for the field trial; 262 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 students in schools.

*Explicit stratification:* Organised by funding with two categories (public, private) and grade structure with three categories (grades 6-8,7-9 or 7-8; grades 9-12; other grade structure) for public schools and grade structure with two categories (grades 6-8,7-9, 7-8 or 9-12; other grade structure) for private schools.

*Implicit stratification:* Organised by region with four categories (Northeast, Midwest, South, West), urbanisation with three categories (city, suburb, town/rural), race with two categories (high proportion of non-white students, low proportion of non-white students) and state with 51 categories for public schools.

*Data sources:* Public schools: data used for school sampling were obtained from the Common Core of Data and referred to school year 2021/22. Private schools: data used for school sampling were obtained from the Private School Survey and referred to 2019/20.

**Table A D.1. School participation status: survey of principals – United States, ISCED level 2**

| Explicit stratum                       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Grades 6-8, 7-9 or 7-8        | 118                   | 0                  | 0                | 61                            | 9                                | 3                                 | 45                        |
| Public – Grades 9-12                   | 70                    | 0                  | 0                | 32                            | 6                                | 1                                 | 31                        |
| Public – Other grade structure         | 48                    | 3                  | 0                | 25                            | 1                                | 3                                 | 16                        |
| Private – Grades 6-8, 7-9, 7-8 or 9-12 | 8                     | 2                  | 0                | 1                             | 4                                | 0                                 | 1                         |
| Private – Other grade structure        | 18                    | 1                  | 0                | 4                             | 1                                | 1                                 | 11                        |
| <b>Total</b>                           | <b>262</b>            | <b>6</b>           | <b>0</b>         | <b>123</b>                    | <b>21</b>                        | <b>8</b>                          | <b>104</b>                |

**Table A D.2. School participation status: survey of teachers – United States, ISCED level 2**

| Explicit stratum                       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Grades 6-8, 7-9 or 7-8        | 118                   | 0                  | 0                | 62                            | 7                                | 3                                 | 46                        |
| Public – Grades 9-12                   | 70                    | 0                  | 0                | 33                            | 6                                | 1                                 | 30                        |
| Public – Other grade structure         | 48                    | 3                  | 0                | 27                            | 1                                | 3                                 | 14                        |
| Private – Grades 6-8, 7-9, 7-8 or 9-12 | 8                     | 2                  | 0                | 1                             | 4                                | 0                                 | 1                         |
| Private – Other grade structure        | 18                    | 1                  | 0                | 4                             | 1                                | 1                                 | 11                        |
| <b>Total</b>                           | <b>262</b>            | <b>6</b>           | <b>0</b>         | <b>127</b>                    | <b>19</b>                        | <b>8</b>                          | <b>102</b>                |



Table A D.3. Teacher participation status – United States, ISCED level 2

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 988        |
| Absent                  | 413          |
| Left school permanently | 13           |
| Not part of sample      | 8            |
| <b>Total</b>            | <b>2 422</b> |

Table A D.4. School participation status: survey of teachers – United States, TKS

| Explicit stratum                       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Grades 6-8, 7-9 or 7-8        | 118                   | 0                  | 0                | 59                            | 7                                | 3                                 | 49                        |
| Public – Grades 9-12                   | 70                    | 0                  | 0                | 31                            | 6                                | 1                                 | 32                        |
| Public – Other grade structure         | 48                    | 3                  | 0                | 24                            | 1                                | 3                                 | 17                        |
| Private – Grades 6-8, 7-9, 7-8 or 9-12 | 8                     | 2                  | 0                | 1                             | 3                                | 0                                 | 2                         |
| Private – Other grade structure        | 18                    | 1                  | 0                | 4                             | 1                                | 1                                 | 11                        |
| <b>Total</b>                           | <b>262</b>            | <b>6</b>           | <b>0</b>         | <b>119</b>                    | <b>18</b>                        | <b>8</b>                          | <b>111</b>                |

Table A D.5. Teacher participation status – United States, TKS

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 362        |
| Absent                  | 347          |
| Left school permanently | 11           |
| Not part of sample      | 8            |
| <b>Total</b>            | <b>1 728</b> |

### **Uzbekistan: ISCED level 2**

ISCED level 2 in Uzbekistan consists of “Lower secondary education” and comprises Grades 5 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers; then adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 30 schools were selected for the field trial; 210 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by region with 14 categories.

*Implicit stratification:* Organised by urbanisation with two categories (urban, rural).

*Data sources:* Data used for school sampling were obtained from the National Research Institute of Professional Development and Teaching New Methodologies to Teachers Named After A. Avloni and referred to school year 2023/24.

**Table A D.1. School participation status: survey of principals – Uzbekistan, ISCED level 2**

| Explicit stratum        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Andijan Region          | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Bukhara Region          | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Fergana Region          | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Jizzakh Region          | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Karakalpakstan Republic | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Kashkadarya Region      | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Khorezm Region          | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Navoiy Region           | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Namangan Region         | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Samarkand Region        | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Surkhandarya Region     | 18                    | 0                  | 0                | 18                            | 0                                | 0                                 | 0                         |
| Syrdarya Region         | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Tashkent City           | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Tashkent Region         | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| <b>Total</b>            | <b>210</b>            | <b>0</b>           | <b>0</b>         | <b>210</b>                    | <b>0</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.2. School participation status: survey of teachers – Uzbekistan, ISCED level 2**

| Explicit stratum        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Andijan Region          | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Bukhara Region          | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Fergana Region          | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Jizzakh Region          | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Karakalpakstan Republic | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Kashkadarya Region      | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |

| Explicit stratum    | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Khorezm Region      | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Navoiy Region       | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Namangan Region     | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Samarkand Region    | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Surkhandarya Region | 18                    | 0                  | 0                | 18                            | 0                                | 0                                 | 0                         |
| Syrdarya Region     | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Tashkent City       | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Tashkent Region     | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| <b>Total</b>        | <b>210</b>            | <b>0</b>           | <b>0</b>         | <b>210</b>                    | <b>0</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.3. Teacher participation status – Uzbekistan, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 431        |
| Absent                  | 61           |
| Left school permanently | 13           |
| Not part of sample      | 2            |
| <b>Total</b>            | <b>4 507</b> |

### Viet Nam: ISCED level 2

ISCED level 2 in Viet Nam consists of “Lower secondary” and comprises Grades 6 to 9 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 2 teachers.

*Sample sizes:* 30 schools were selected for the field trial; 202 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 2 teachers in schools.

*Explicit stratification:* Organised by region with six categories (Central Highlands, Mekong Delta, Northern Midlands and Mountains, North Central and Central Coast, Red River Delta, Southeast).

*Implicit stratification:* Organised by urbanisation with three categories (urban, rural, remote area).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and Training and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Viet Nam, ISCED level 2**

| Explicit stratum                | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Northern Midlands and Mountains | 36                    | 0                  | 0                | 36                            | 0                                | 0                                 | 0                         |
| Red River Delta                 | 46                    | 0                  | 0                | 46                            | 0                                | 0                                 | 0                         |
| North Central and Central Coast | 44                    | 0                  | 0                | 44                            | 0                                | 0                                 | 0                         |
| Central Highlands               | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Southeast                       | 28                    | 0                  | 0                | 28                            | 0                                | 0                                 | 0                         |
| Mekong Delta                    | 34                    | 0                  | 0                | 34                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                    | <b>202</b>            | <b>0</b>           | <b>0</b>         | <b>202</b>                    | <b>0</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.2. School participation status: survey of teachers – Viet Nam, ISCED level 2**

| Explicit stratum                | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Northern Midlands and Mountains | 36                    | 0                  | 0                | 36                            | 0                                | 0                                 | 0                         |
| Red River Delta                 | 46                    | 0                  | 0                | 46                            | 0                                | 0                                 | 0                         |
| North Central and Central Coast | 44                    | 0                  | 0                | 44                            | 0                                | 0                                 | 0                         |
| Central Highlands               | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| Southeast                       | 28                    | 0                  | 0                | 28                            | 0                                | 0                                 | 0                         |
| Mekong Delta                    | 34                    | 0                  | 0                | 34                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                    | <b>202</b>            | <b>0</b>           | <b>0</b>         | <b>202</b>                    | <b>0</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.3. Teacher participation status – Viet Nam, ISCED level 2**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 348        |
| Absent                  | 42           |
| Left school permanently | 13           |
| Not part of sample      | 7            |
| <b>Total</b>            | <b>4 410</b> |

## Characteristics of national samples, ISCED level 1

### Australia: ISCED level 1

ISCED level 1 in Australia consists of “Primary school” and comprises Grades 1 to 7 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 1 teachers, then adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 32 schools were selected for the field trial; 208 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 1 only, ISCED levels 1 and 2) and sector with three categories (government, independent, Catholic).

*Implicit stratification:* Organised by socio-economic status with three categories (low, medium, high).

*Data sources:* Data used for school sampling were obtained from the Australian Council for Educational Research and referred to 2022.

**Table A D.1. School participation status: survey of principals – Australia, ISCED level 1**

| Explicit stratum                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Government         | 124                   | 0                  | 0                | 68                            | 27                               | 7                                 | 22                        |
| ISCED 1 only – Independent        | 8                     | 0                  | 0                | 6                             | 1                                | 1                                 | 0                         |
| ISCED 1 only – Catholic           | 34                    | 0                  | 0                | 28                            | 3                                | 0                                 | 3                         |
| ISCED 1 and ISCED 2 – Government  | 10                    | 0                  | 0                | 6                             | 2                                | 0                                 | 2                         |
| ISCED 1 and ISCED 2 – Independent | 24                    | 0                  | 0                | 17                            | 4                                | 0                                 | 3                         |
| ISCED 1 and ISCED 2 – Catholic    | 8                     | 0                  | 0                | 6                             | 1                                | 1                                 | 0                         |
| <b>Total</b>                      | <b>208</b>            | <b>0</b>           | <b>0</b>         | <b>131</b>                    | <b>38</b>                        | <b>9</b>                          | <b>30</b>                 |

**Table A D.2. School participation status: survey of teachers – Australia, ISCED level 1**

| Explicit stratum                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Government         | 124                   | 0                  | 0                | 68                            | 27                               | 7                                 | 22                        |
| ISCED 1 only – Independent        | 8                     | 0                  | 0                | 6                             | 1                                | 1                                 | 0                         |
| ISCED 1 only – Catholic           | 34                    | 0                  | 0                | 28                            | 3                                | 0                                 | 3                         |
| ISCED 1 and ISCED 2 – Government  | 10                    | 0                  | 0                | 6                             | 2                                | 0                                 | 2                         |
| ISCED 1 and ISCED 2 – Independent | 24                    | 0                  | 0                | 17                            | 4                                | 0                                 | 3                         |
| ISCED 1 and ISCED 2 – Catholic    | 8                     | 0                  | 0                | 6                             | 1                                | 1                                 | 0                         |
| <b>Total</b>                      | <b>208</b>            | <b>0</b>           | <b>0</b>         | <b>131</b>                    | <b>38</b>                        | <b>9</b>                          | <b>30</b>                 |

Table A D.3. Teacher participation status – Australia, ISCED level 1

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 003        |
| Absent                  | 338          |
| Left school permanently | 12           |
| Not part of sample      | 50           |
| <b>Total</b>            | <b>3 403</b> |

### Belgium: ISCED level 1

The target population comprises the Flemish and French Communities of Belgium, not including the German Community.

ISCED level 1 in the Flemish Community of Belgium consists of “Regular primary education” and “European school – regular primary education” and comprises Grades 1 to 6 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

ISCED level 1 in the French Community of Belgium consists of “Regular primary education” and comprises Grades 1 to 6 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to accommodate separate adjudication of communities.

*Sample sizes:* 30 schools were selected for the field trial; 412 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by community with two categories (Flemish Community, French Community), by funding with three categories (public at the state level, public at the local level, private) within the French Community, by socio-economic status with four categories (very disadvantaged, disadvantaged, advantaged, very advantaged) for public at the local level and private schools within the French Community, by overlap with two categories (ISCED level 1 only, ISCED levels 02 and 1) within the Flemish Community and by educational network with three categories (education organised by the Flemish Community, government-aided public education, government-aided private education) for ISCED levels 02 and 1 schools within the Flemish Community.

*Implicit stratification:* Organised by funding with two categories (public, private). within the Flemish Community and by socio-economic status with four categories (very disadvantaged, disadvantaged, advantaged, very advantaged) within the French Community.

*Data sources:* For the Flemish Community, data used for school sampling were obtained from the Ministry of Education and Training and referred to school year 2022/23. For the French Community, data used for school sampling were obtained from the General Administration of Education and referred to school year 2022/23.

**Table A D.1. School participation status: survey of principals – Belgium, ISCED level 1**

| Explicit stratum                                                                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Flemish Community – ISCED 1 only                                                        | 18                    | 0                  | 0                | 6                             | 4                                | 1                                 | 7                         |
| Flemish Community – ISCED 02 and ISCED 1 – Education organised by the Flemish Community | 38                    | 1                  | 0                | 19                            | 4                                | 3                                 | 11                        |
| Flemish Community – ISCED 02 and ISCED 1 – Government-aided public education            | 48                    | 0                  | 0                | 28                            | 10                               | 3                                 | 7                         |
| Flemish Community – ISCED 02 and ISCED 1 – Government-aided private education           | 106                   | 0                  | 0                | 44                            | 19                               | 17                                | 26                        |
| French Community – Public at the state level                                            | 16                    | 0                  | 0                | 14                            | 0                                | 0                                 | 2                         |
| French Community – Public at the local level – Very disadvantaged schools               | 36                    | 0                  | 0                | 29                            | 3                                | 1                                 | 3                         |

| Explicit stratum                                                       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| French Community – Public at the local level – Disadvantaged schools   | 26                    | 0                  | 0                | 21                            | 2                                | 1                                 | 2                         |
| French Community – Public at the local level – Advantaged schools      | 28                    | 0                  | 0                | 22                            | 4                                | 0                                 | 2                         |
| French Community – Public at the local level – Very advantaged schools | 26                    | 0                  | 0                | 23                            | 2                                | 0                                 | 1                         |
| French Community – Private – Very disadvantaged schools                | 14                    | 0                  | 0                | 7                             | 2                                | 0                                 | 5                         |
| French Community – Private – Disadvantaged schools                     | 18                    | 0                  | 0                | 12                            | 3                                | 0                                 | 3                         |
| French Community – Private – Advantaged schools                        | 16                    | 0                  | 0                | 11                            | 1                                | 1                                 | 3                         |
| French Community – Private – Very advantaged schools                   | 22                    | 0                  | 0                | 15                            | 1                                | 0                                 | 6                         |
| <b>Total</b>                                                           | <b>412</b>            | <b>1</b>           | <b>0</b>         | <b>251</b>                    | <b>55</b>                        | <b>27</b>                         | <b>78</b>                 |

Table A D.2. School participation status: survey of teachers – Belgium, ISCED level 1

| Explicit stratum                                                                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Flemish Community – ISCED 1 only                                                        | 18                    | 0                  | 0                | 7                             | 2                                | 1                                 | 8                         |
| Flemish Community – ISCED 02 and ISCED 1 – Education organised by the Flemish Community | 38                    | 1                  | 0                | 18                            | 4                                | 2                                 | 13                        |
| Flemish Community – ISCED 02 and ISCED 1 – Government-aided public education            | 48                    | 0                  | 0                | 23                            | 10                               | 4                                 | 11                        |
| Flemish Community – ISCED 02 and ISCED 1 – Government-aided private education           | 106                   | 0                  | 0                | 40                            | 18                               | 17                                | 31                        |
| French Community – Public at the state level                                            | 16                    | 0                  | 0                | 15                            | 0                                | 0                                 | 1                         |
| French Community – Public at the local level – Very disadvantaged schools               | 36                    | 0                  | 0                | 29                            | 2                                | 1                                 | 4                         |
| French Community – Public at the local level – Disadvantaged schools                    | 26                    | 0                  | 0                | 21                            | 2                                | 1                                 | 2                         |
| French Community – Public at the local level – Advantaged schools                       | 28                    | 0                  | 0                | 21                            | 4                                | 0                                 | 3                         |
| French Community – Public at the local level – Very advantaged schools                  | 26                    | 0                  | 0                | 24                            | 2                                | 0                                 | 0                         |
| French Community – Private – Very disadvantaged schools                                 | 14                    | 0                  | 0                | 8                             | 2                                | 1                                 | 3                         |
| French Community – Private – Disadvantaged schools                                      | 18                    | 0                  | 0                | 12                            | 3                                | 0                                 | 3                         |
| French Community – Private – Advantaged schools                                         | 16                    | 0                  | 0                | 11                            | 1                                | 1                                 | 3                         |
| French Community – Private – Very advantaged schools                                    | 22                    | 0                  | 0                | 17                            | 2                                | 0                                 | 3                         |
| <b>Total</b>                                                                            | <b>412</b>            | <b>1</b>           | <b>0</b>         | <b>246</b>                    | <b>52</b>                        | <b>28</b>                         | <b>85</b>                 |



Table A D.3. Teacher participation status – Belgium, ISCED level 1

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 913        |
| Absent                  | 919          |
| Left school permanently | 43           |
| Not part of sample      | 117          |
| <b>Total</b>            | <b>5 992</b> |

### ***Flemish Community (Belgium): ISCED level 1***

ISCED level 1 in the Flemish Community of Belgium consists of “Regular primary education” and “European school – regular primary education” and comprises Grades 1 to 6 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 1 teachers.

*Sample sizes:* 210 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 1 only, ISCED levels 02 and 1) and educational network with three categories (education organised by the Flemish Community, government-aided public education, government-aided private education) for ISCED levels 02 and 1 schools.

*Implicit stratification:* Organised by funding with two categories (public, private).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and Training and referred to school year 2022/23.

**Table A D.1. School participation status: survey of principals – Flemish Community (Belgium), ISCED level 1**

| Explicit stratum                                                    | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only                                                        | 18                    | 0                  | 0                | 6                             | 4                                | 1                                 | 7                         |
| ISCED 02 and ISCED 1 – Education organised by the Flemish Community | 38                    | 1                  | 0                | 19                            | 4                                | 3                                 | 11                        |
| ISCED 02 and ISCED 1 – Government-aided public education            | 48                    | 0                  | 0                | 28                            | 10                               | 3                                 | 7                         |
| ISCED 02 and ISCED 1 – Government-aided private education           | 106                   | 0                  | 0                | 44                            | 19                               | 17                                | 26                        |
| <b>Total</b>                                                        | <b>210</b>            | <b>1</b>           | <b>0</b>         | <b>97</b>                     | <b>37</b>                        | <b>24</b>                         | <b>51</b>                 |

**Table A D.2. School participation status: survey of teachers – Flemish Community (Belgium), ISCED level 1**

| Explicit stratum                                                    | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only                                                        | 18                    | 0                  | 0                | 7                             | 2                                | 1                                 | 8                         |
| ISCED 02 and ISCED 1 – Education organised by the Flemish Community | 38                    | 1                  | 0                | 18                            | 4                                | 2                                 | 13                        |
| ISCED 02 and ISCED 1 – Government-aided public education            | 48                    | 0                  | 0                | 23                            | 10                               | 4                                 | 11                        |
| ISCED 02 and ISCED 1 – Government-aided private education           | 106                   | 0                  | 0                | 40                            | 18                               | 17                                | 31                        |
| <b>Total</b>                                                        | <b>210</b>            | <b>1</b>           | <b>0</b>         | <b>88</b>                     | <b>34</b>                        | <b>24</b>                         | <b>63</b>                 |

Table A D.3. Teacher participation status – Flemish Community (Belgium), ISCED level 1

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 258        |
| Absent                  | 308          |
| Left school permanently | 11           |
| Not part of sample      | 66           |
| <b>Total</b>            | <b>2 643</b> |

### **French Community (Belgium): ISCED level 1**

ISCED level 1 in the French Community of Belgium consists of “Regular primary education” and comprises Grades 1 to 6 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 1 teachers.

*Sample sizes:* 30 schools were selected for the field trial; 202 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by funding with three categories (public at the state level, public at the local level, private) and socio-economic status with four categories (very disadvantaged, disadvantaged, advantaged, very advantaged) for public at the local level and private schools.

*Implicit stratification:* Organised by socio-economic status with four categories (very disadvantaged, disadvantaged, advantaged, very advantaged).

*Data sources:* Data used for school sampling were obtained from the General Administration of Education and referred to school year 2022/23.

**Table A D.1. School participation status: survey of principals – French Community (Belgium), ISCED level 1**

| Explicit stratum                                       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public at the state level                              | 16                    | 0                  | 0                | 14                            | 0                                | 0                                 | 2                         |
| Public at the local level – Very disadvantaged schools | 36                    | 0                  | 0                | 29                            | 3                                | 1                                 | 3                         |
| Public at the local level – Disadvantaged schools      | 26                    | 0                  | 0                | 21                            | 2                                | 1                                 | 2                         |
| Public at the local level – Advantaged schools         | 28                    | 0                  | 0                | 22                            | 4                                | 0                                 | 2                         |
| Public at the local level – Very advantaged schools    | 26                    | 0                  | 0                | 23                            | 2                                | 0                                 | 1                         |
| Private – Very disadvantaged schools                   | 14                    | 0                  | 0                | 7                             | 2                                | 0                                 | 5                         |
| Private – Disadvantaged schools                        | 18                    | 0                  | 0                | 12                            | 3                                | 0                                 | 3                         |
| Private – Advantaged schools                           | 16                    | 0                  | 0                | 11                            | 1                                | 1                                 | 3                         |
| Private – Very advantaged schools                      | 22                    | 0                  | 0                | 15                            | 1                                | 0                                 | 6                         |
| <b>Total</b>                                           | <b>202</b>            | <b>0</b>           | <b>0</b>         | <b>154</b>                    | <b>18</b>                        | <b>3</b>                          | <b>27</b>                 |

**Table A D.2. School participation status: survey of teachers – French Community (Belgium), ISCED level 1**

| Explicit stratum                                       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public at the state level                              | 16                    | 0                  | 0                | 15                            | 0                                | 0                                 | 1                         |
| Public at the local level – Very disadvantaged schools | 36                    | 0                  | 0                | 29                            | 2                                | 1                                 | 4                         |
| Public at the local level – Disadvantaged schools      | 26                    | 0                  | 0                | 21                            | 2                                | 1                                 | 2                         |

| Explicit stratum                                    | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public at the local level – Advantaged schools      | 28                    | 0                  | 0                | 21                            | 4                                | 0                                 | 3                         |
| Public at the local level – Very advantaged schools | 26                    | 0                  | 0                | 24                            | 2                                | 0                                 | 0                         |
| Private – Very disadvantaged schools                | 14                    | 0                  | 0                | 8                             | 2                                | 1                                 | 3                         |
| Private – Disadvantaged schools                     | 18                    | 0                  | 0                | 12                            | 3                                | 0                                 | 3                         |
| Private – Advantaged schools                        | 16                    | 0                  | 0                | 11                            | 1                                | 1                                 | 3                         |
| Private – Very advantaged schools                   | 22                    | 0                  | 0                | 17                            | 2                                | 0                                 | 3                         |
| <b>Total</b>                                        | <b>202</b>            | <b>0</b>           | <b>0</b>         | <b>158</b>                    | <b>18</b>                        | <b>4</b>                          | <b>22</b>                 |

**Table A D.3. Teacher participation status – French Community (Belgium), ISCED level 1**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 655        |
| Absent                  | 611          |
| Left school permanently | 32           |
| Not part of sample      | 51           |
| <b>Total</b>            | <b>3 349</b> |

### Brazil: ISCED level 1

ISCED level 1 in Brazil consists of “Fundamental education (Years 1-5)” and comprises Grades 1 to 5 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 1 teachers, then adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 33 schools were selected for the field trial; 342 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 1 only, ISCED levels 1 and 2) and type with four categories (federal, regional, local, private).

*Implicit stratification:* Organised by region with five categories (Central-West, North, Northeast, South, Southeast).

*Data sources:* Data used for school sampling were obtained from the national School Census and referred to 2022.

**Table A D.1. School participation status: survey of principals – Brazil, ISCED level 1**

| Explicit stratum               | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Federal         | 8                     | 0                  | 0                | 4                             | 0                                | 0                                 | 4                         |
| ISCED 1 only – Regional        | 18                    | 0                  | 1                | 14                            | 1                                | 0                                 | 2                         |
| ISCED 1 only – Local           | 132                   | 4                  | 4                | 114                           | 7                                | 0                                 | 3                         |
| ISCED 1 only – Private         | 22                    | 0                  | 0                | 13                            | 5                                | 0                                 | 4                         |
| ISCED 1 and ISCED 2 – Federal  | 8                     | 0                  | 1                | 4                             | 0                                | 0                                 | 3                         |
| ISCED 1 and ISCED 2 – Regional | 20                    | 2                  | 6                | 12                            | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Local    | 80                    | 1                  | 6                | 65                            | 4                                | 0                                 | 4                         |
| ISCED 1 and ISCED 2 – Private  | 54                    | 4                  | 1                | 31                            | 8                                | 2                                 | 8                         |
| <b>Total</b>                   | <b>342</b>            | <b>11</b>          | <b>19</b>        | <b>257</b>                    | <b>25</b>                        | <b>2</b>                          | <b>28</b>                 |

**Table A D.2. School participation status: survey of teachers – Brazil, ISCED level 1**

| Explicit stratum               | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Federal         | 8                     | 0                  | 0                | 4                             | 0                                | 0                                 | 4                         |
| ISCED 1 only – Regional        | 18                    | 0                  | 1                | 14                            | 1                                | 0                                 | 2                         |
| ISCED 1 only – Local           | 132                   | 4                  | 4                | 113                           | 7                                | 0                                 | 4                         |
| ISCED 1 only – Private         | 22                    | 0                  | 0                | 12                            | 5                                | 0                                 | 5                         |
| ISCED 1 and ISCED 2 – Federal  | 8                     | 0                  | 1                | 4                             | 0                                | 0                                 | 3                         |
| ISCED 1 and ISCED 2 – Regional | 20                    | 2                  | 6                | 11                            | 0                                | 0                                 | 1                         |
| ISCED 1 and ISCED 2 – Local    | 80                    | 1                  | 6                | 63                            | 4                                | 0                                 | 6                         |
| ISCED 1 and ISCED 2 – Private  | 54                    | 4                  | 1                | 31                            | 8                                | 2                                 | 8                         |
| <b>Total</b>                   | <b>342</b>            | <b>11</b>          | <b>19</b>        | <b>252</b>                    | <b>25</b>                        | <b>2</b>                          | <b>33</b>                 |

Table A D.3. Teacher participation status – Brazil, ISCED level 1

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 994        |
| Absent                  | 111          |
| Left school permanently | 90           |
| Not part of sample      | 69           |
| <b>Total</b>            | <b>3 264</b> |

### France: ISCED level 1

ISCED level 1 in France consists of “Primary education” and comprises Grades 1 to 5 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 1 teachers.

*Sample sizes:* 30 schools were selected for the field trial; 348 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of teachers in ISCED level 1 schools.

*Explicit stratification:* Organised by school sector with three categories (public school non-priority education, public school priority education, private school under contract with the state).

*Implicit stratification:* Organised by urbanisation with three categories (fewer than 10 000 inhabitants, 10 000 to 199 999 inhabitants, more than 199 999 inhabitants).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – France, ISCED level 1**

| Explicit stratum                             | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public school non-priority education         | 232                   | 2                  | 0                | 210                           | 3                                | 0                                 | 17                        |
| Public school priority education             | 62                    | 1                  | 0                | 58                            | 1                                | 0                                 | 2                         |
| Private school under contract with the state | 54                    | 0                  | 0                | 49                            | 1                                | 0                                 | 4                         |
| <b>Total</b>                                 | <b>348</b>            | <b>3</b>           | <b>0</b>         | <b>317</b>                    | <b>5</b>                         | <b>0</b>                          | <b>23</b>                 |

**Table A D.2. School participation status: survey of teachers – France, ISCED level 1**

| Explicit stratum                             | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public school non-priority education         | 232                   | 25                 | 0                | 183                           | 4                                | 0                                 | 20                        |
| Public school priority education             | 62                    | 3                  | 0                | 53                            | 1                                | 0                                 | 5                         |
| Private school under contract with the state | 54                    | 1                  | 0                | 47                            | 3                                | 0                                 | 3                         |
| <b>Total</b>                                 | <b>348</b>            | <b>29</b>          | <b>0</b>         | <b>283</b>                    | <b>8</b>                         | <b>0</b>                          | <b>28</b>                 |

**Table A D.3. Teacher participation status – France, ISCED level 1**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 993        |
| Absent                  | 253          |
| Left school permanently | 0            |
| Not part of sample      | 102          |
| <b>Total</b>            | <b>2 348</b> |



### Japan: ISCED level 1

ISCED level 1 in Japan consists of “Elementary school” and “Compulsory education school” and comprises Grades 1 to 6 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 1 teachers, then adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 32 schools were selected for the field trial; 210 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 1 only, ISCED levels 1 and 2) and urbanisation with four categories (very large city, large city, small city, non-city area) for ISCED level 1 only schools.

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education, Culture, Sports, Science and Technology and referred to 2021.

**Table A D.1. School participation status: survey of principals – Japan, ISCED level 1**

| Explicit stratum               | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Very large city | 50                    | 0                  | 0                | 48                            | 2                                | 0                                 | 0                         |
| ISCED 1 only – Large city      | 32                    | 0                  | 0                | 30                            | 1                                | 1                                 | 0                         |
| ISCED 1 only – Small city      | 96                    | 0                  | 0                | 79                            | 13                               | 0                                 | 4                         |
| ISCED 1 only – Non-city area   | 24                    | 0                  | 0                | 20                            | 3                                | 1                                 | 0                         |
| ISCED 1 and ISCED 2            | 4                     | 0                  | 0                | 3                             | 1                                | 0                                 | 0                         |
| <b>Total</b>                   | <b>206</b>            | <b>0</b>           | <b>0</b>         | <b>180</b>                    | <b>20</b>                        | <b>2</b>                          | <b>4</b>                  |

**Table A D.2. School participation status: survey of teachers – Japan, ISCED level 1**

| Explicit stratum               | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|--------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Very large city | 50                    | 0                  | 0                | 48                            | 2                                | 0                                 | 0                         |
| ISCED 1 only – Large city      | 32                    | 0                  | 0                | 30                            | 1                                | 1                                 | 0                         |
| ISCED 1 only – Small city      | 96                    | 0                  | 0                | 79                            | 13                               | 0                                 | 4                         |
| ISCED 1 only – Non-city area   | 24                    | 0                  | 0                | 20                            | 3                                | 1                                 | 0                         |
| ISCED 1 and ISCED 2            | 4                     | 0                  | 0                | 3                             | 1                                | 0                                 | 0                         |
| <b>Total</b>                   | <b>206</b>            | <b>0</b>           | <b>0</b>         | <b>180</b>                    | <b>20</b>                        | <b>2</b>                          | <b>4</b>                  |

**Table A D.3. Teacher participation status – Japan, ISCED level 1**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 356        |
| Absent                  | 73           |
| Left school permanently | 34           |
| Not part of sample      | 4            |
| <b>Total</b>            | <b>3 467</b> |

### Korea: ISCED level 1

ISCED level 1 in Korea consists of “Elementary school” and comprises Grades 1 to 6 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 1 teachers, then adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 34 schools were selected for the field trial; 224 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by local offices of education with 17 categories.

*Implicit stratification:* Organised by urbanisation with three categories (large city, city, town).

*Data sources:* Data used for school sampling were obtained from the Center for Educational Statistics (KEDI) and referred to 2021.

**Table A D.1. School participation status: survey of principals – Korea, ISCED level 1**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Seoul            | 32                    | 0                  | 0                | 20                            | 10                               | 0                                 | 2                         |
| Busan            | 12                    | 0                  | 0                | 9                             | 3                                | 0                                 | 0                         |
| Daegu            | 10                    | 0                  | 0                | 6                             | 2                                | 0                                 | 2                         |
| Incheon          | 12                    | 0                  | 0                | 11                            | 1                                | 0                                 | 0                         |
| Gwangju          | 8                     | 0                  | 0                | 6                             | 2                                | 0                                 | 0                         |
| Daejeon          | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Ulsan            | 8                     | 0                  | 0                | 3                             | 0                                | 3                                 | 2                         |
| Sejong           | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Gyeonggi         | 52                    | 0                  | 0                | 27                            | 14                               | 1                                 | 10                        |
| Gangwon          | 8                     | 0                  | 0                | 5                             | 1                                | 0                                 | 2                         |
| Chungbuk         | 8                     | 0                  | 0                | 6                             | 0                                | 2                                 | 0                         |
| Chungnam         | 10                    | 0                  | 0                | 8                             | 1                                | 0                                 | 1                         |
| Jeonbuk          | 8                     | 0                  | 0                | 5                             | 1                                | 0                                 | 2                         |
| Jeonnam          | 8                     | 0                  | 0                | 5                             | 2                                | 0                                 | 1                         |
| Gyeongbuk        | 10                    | 0                  | 0                | 8                             | 0                                | 2                                 | 0                         |
| Gyeongnam        | 14                    | 0                  | 0                | 8                             | 2                                | 1                                 | 3                         |
| Jeju             | 8                     | 0                  | 0                | 5                             | 2                                | 0                                 | 1                         |
| <b>Total</b>     | <b>224</b>            | <b>0</b>           | <b>0</b>         | <b>148</b>                    | <b>41</b>                        | <b>9</b>                          | <b>26</b>                 |

**Table A D.2. School participation status: survey of teachers – Korea, ISCED level 1**

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Seoul            | 32                    | 0                  | 0                | 15                            | 9                                | 0                                 | 8                         |
| Busan            | 12                    | 0                  | 0                | 9                             | 3                                | 0                                 | 0                         |
| Daegu            | 10                    | 0                  | 0                | 6                             | 2                                | 0                                 | 2                         |
| Incheon          | 12                    | 0                  | 0                | 7                             | 1                                | 0                                 | 4                         |

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Gwangju          | 8                     | 0                  | 0                | 5                             | 2                                | 0                                 | 1                         |
| Daejeon          | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Ulsan            | 8                     | 0                  | 0                | 5                             | 0                                | 3                                 | 0                         |
| Sejong           | 8                     | 0                  | 0                | 5                             | 0                                | 0                                 | 3                         |
| Gyeonggi         | 52                    | 0                  | 0                | 24                            | 13                               | 1                                 | 14                        |
| Gangwon          | 8                     | 0                  | 0                | 5                             | 1                                | 0                                 | 2                         |
| Chungbuk         | 8                     | 0                  | 0                | 5                             | 0                                | 2                                 | 1                         |
| Chungnam         | 10                    | 0                  | 0                | 8                             | 1                                | 0                                 | 1                         |
| Jeonbuk          | 8                     | 0                  | 0                | 6                             | 1                                | 0                                 | 1                         |
| Jeonnam          | 8                     | 0                  | 0                | 6                             | 2                                | 0                                 | 0                         |
| Gyeongbuk        | 10                    | 0                  | 0                | 8                             | 0                                | 1                                 | 1                         |
| Gyeongnam        | 14                    | 0                  | 0                | 8                             | 2                                | 2                                 | 2                         |
| Jeju             | 8                     | 0                  | 0                | 5                             | 3                                | 0                                 | 0                         |
| <b>Total</b>     | <b>224</b>            | <b>0</b>           | <b>0</b>         | <b>135</b>                    | <b>40</b>                        | <b>9</b>                          | <b>40</b>                 |

Table A D.3. Teacher participation status – Korea, ISCED level 1

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 124        |
| Absent                  | 323          |
| Left school permanently | 2            |
| Not part of sample      | 12           |
| <b>Total</b>            | <b>3 461</b> |

### Morocco: ISCED level 1

ISCED level 1 in Morocco consists of “*Enseignement primaire*” and comprises Grades 1 to 6 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between regions and between public and private schools.

*Sample sizes:* 32 schools were selected for the field trial; 400 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 students in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 1 only, ISCED levels 1 and 2), funding with two categories (public, private) and region with ten categories for public schools.

*Implicit stratification:* Organised by urbanisation with two categories (urban, rural).

*Data sources:* Data used for school sampling were obtained from the Ministry of National Education and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Morocco, ISCED level 1**

| Explicit stratum                                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Public – Tanger-Tetouan-Al Hoceima | 32                    | 0                  | 0                | 32                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Oriental                  | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Fès-Meknès                | 36                    | 0                  | 0                | 36                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Rabat-Salé-Kénitra        | 34                    | 0                  | 0                | 34                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Béni Mellal-Khénifra      | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Casablanca-Settat         | 47                    | 0                  | 0                | 47                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Marrakech-Safi            | 44                    | 1                  | 0                | 41                            | 0                                | 0                                 | 2                         |
| ISCED 1 only – Public – Drâa-Tafilalet            | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Souss-Massa               | 30                    | 1                  | 0                | 28                            | 0                                | 0                                 | 1                         |
| ISCED 1 only – Public – South                     | 31                    | 1                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Private                            | 28                    | 3                  | 0                | 24                            | 0                                | 0                                 | 1                         |
| ISCED 1 and ISCED 2 – Private                     | 30                    | 2                  | 0                | 27                            | 0                                | 0                                 | 1                         |
| <b>Total</b>                                      | <b>402</b>            | <b>8</b>           | <b>0</b>         | <b>389</b>                    | <b>0</b>                         | <b>0</b>                          | <b>5</b>                  |

**Table A D.2. School participation status: survey of teachers – Morocco, ISCED level 1**

| Explicit stratum                                  | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Public – Tanger-Tetouan-Al Hoceima | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Oriental                  | 36                    | 0                  | 0                | 36                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Fès-Meknès                | 34                    | 0                  | 0                | 34                            | 0                                | 0                                 | 0                         |

| Explicit stratum                             | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Public – Rabat-Salé-Kénitra   | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Béni Mellal-Khénifra | 47                    | 0                  | 0                | 47                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Casablanca-Settat    | 44                    | 1                  | 0                | 43                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Marrakech-Safi       | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Drâa-Tafilalet       | 30                    | 1                  | 0                | 29                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – Souss-Massa          | 31                    | 1                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Public – South                | 28                    | 3                  | 0                | 25                            | 0                                | 0                                 | 0                         |
| ISCED 1 only – Private                       | 30                    | 2                  | 0                | 28                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                                 | <b>402</b>            | <b>8</b>           | <b>0</b>         | <b>394</b>                    | <b>0</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.3. Teacher participation status – Morocco, ISCED level 1**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 905        |
| Absent                  | 61           |
| Left school permanently | 32           |
| Not part of sample      | 37           |
| <b>Total</b>            | <b>5 035</b> |

### Netherlands: ISCED level 1

The target population comprises the European Netherlands, not including the Dutch Caribbean.

ISCED level 1 in the Netherlands consists of “Primary education group (class) 3-8” and comprises Grades 1 to 6, counting from the first year of ISCED level 1 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 1 students.

*Sample sizes:* 30 schools were selected for the field trial; 200 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 students in schools.

*Explicit stratification:* Organised by quintiles of disadvantage score with three categories (1st-3rd quintile, 4th quintile, 5th quintile).

*Implicit stratification:* Organised by region with four categories (east, middle, north, south).

*Data sources:* Data used for school sampling were obtained from the Education Implementation Service of the Ministry of Education, Culture and Science and referred to 2021.

**T Table A D.1. School participation status: survey of principals – Netherlands, ISCED level 1**

| Explicit stratum                                              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Disadvantage score, 1 <sup>st</sup> -3 <sup>rd</sup> quintile | 124                   | 4                  | 0                | 51                            | 23                               | 9                                 | 37                        |
| Disadvantage score, 4 <sup>th</sup> quintile                  | 38                    | 0                  | 0                | 20                            | 4                                | 4                                 | 10                        |
| Disadvantage score, 5 <sup>th</sup> quintile                  | 38                    | 2                  | 0                | 15                            | 4                                | 2                                 | 15                        |
| <b>Total</b>                                                  | <b>200</b>            | <b>6</b>           | <b>0</b>         | <b>86</b>                     | <b>31</b>                        | <b>15</b>                         | <b>62</b>                 |

**Table A D.2. School participation status: survey of teachers – Netherlands, ISCED level 1**

| Explicit stratum                                              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Disadvantage score, 1 <sup>st</sup> -3 <sup>rd</sup> quintile | 124                   | 4                  | 0                | 55                            | 23                               | 11                                | 31                        |
| Disadvantage score, 4 <sup>th</sup> quintile                  | 38                    | 0                  | 0                | 20                            | 5                                | 4                                 | 9                         |
| Disadvantage score, 5 <sup>th</sup> quintile                  | 38                    | 2                  | 0                | 16                            | 4                                | 2                                 | 14                        |
| <b>Total</b>                                                  | <b>200</b>            | <b>6</b>           | <b>0</b>         | <b>91</b>                     | <b>32</b>                        | <b>17</b>                         | <b>54</b>                 |

**Table A D.3. Teacher participation status – Netherlands, ISCED level 1**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 305        |
| Absent                  | 225          |
| Left school permanently | 5            |
| Not part of sample      | 11           |
| <b>Total</b>            | <b>1 546</b> |

### New Zealand: ISCED level 1

The target population comprises New Zealand, not including the associated states Cook Islands and Niue or the dependent territory Tokelau.

ISCED level 1 in New Zealand consists of “Primary level education (Years 1 to 6)” and comprises Grades 1 to 6 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between school types and equity index levels.

*Sample sizes:* 42 schools were selected for the field trial; 245 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 1 only, ISCED levels 1 and 2), school type with three categories (contributing, full primary, composite) and equity index level with three categories (low or unknown, medium, high). Due to low participation rates, strata were collapsed after the survey administration.

*Implicit stratification:* Organised by language with two categories (Māori language education, no Māori language education) and funding with two categories (public, private).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2022/23.

**Table A D.1. School participation status: survey of principals – New Zealand, ISCED level 1**

| Explicit stratum                   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Contributing        | 126                   | 0                  | 0                | 46                            | 29                               | 1                                 | 50                        |
| ISCED 1 and ISCED 2 – Full primary | 90                    | 0                  | 0                | 29                            | 25                               | 1                                 | 35                        |
| ISCED 1 and ISCED 2 – Composite    | 29                    | 0                  | 0                | 8                             | 2                                | 0                                 | 19                        |
| <b>Total</b>                       | <b>245</b>            | <b>0</b>           | <b>0</b>         | <b>83</b>                     | <b>56</b>                        | <b>2</b>                          | <b>104</b>                |

**Table A D.2. School participation status: survey of teachers – New Zealand, ISCED level 1**

| Explicit stratum                   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Contributing        | 126                   | 1                  | 0                | 40                            | 27                               | 1                                 | 57                        |
| ISCED 1 and ISCED 2 – Full primary | 90                    | 0                  | 0                | 27                            | 23                               | 2                                 | 38                        |
| ISCED 1 and ISCED 2 – Composite    | 29                    | 0                  | 0                | 7                             | 3                                | 0                                 | 19                        |
| <b>Total</b>                       | <b>245</b>            | <b>1</b>           | <b>0</b>         | <b>74</b>                     | <b>53</b>                        | <b>3</b>                          | <b>114</b>                |

**Table A D.3. Teacher participation status – New Zealand, ISCED level 1**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 1 529        |
| Absent                  | 378          |
| Left school permanently | 8            |
| Not part of sample      | 12           |
| <b>Total</b>            | <b>1 927</b> |

### Saudi Arabia: ISCED level 1

ISCED level 1 in Saudi Arabia consists of “Elementary grades” and “Primary education” and comprises Grades 1 to 6 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between public, private and international schools.

*Sample sizes:* 34 schools were selected for the field trial; 232 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by school type with three categories (public, private, international) and gender with two categories (female, male).

*Implicit stratification:* Organised by region with 13 categories.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to 2022.

**Table A D.1. School participation status: survey of principals – Saudi Arabia, ISCED level 1**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Female        | 96                    | 1                  | 0                | 86                            | 0                                | 0                                 | 9                         |
| Public – Male          | 76                    | 7                  | 0                | 68                            | 0                                | 0                                 | 1                         |
| Private – Female       | 16                    | 1                  | 0                | 13                            | 0                                | 0                                 | 2                         |
| Private – Male         | 14                    | 0                  | 0                | 12                            | 0                                | 0                                 | 2                         |
| International – Female | 22                    | 1                  | 0                | 18                            | 0                                | 0                                 | 3                         |
| International – Male   | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| <b>Total</b>           | <b>232</b>            | <b>11</b>          | <b>0</b>         | <b>204</b>                    | <b>0</b>                         | <b>0</b>                          | <b>17</b>                 |

**Table A D.2. School participation status: survey of teachers – Saudi Arabia, ISCED level 1**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Female        | 96                    | 1                  | 0                | 95                            | 0                                | 0                                 | 0                         |
| Public – Male          | 76                    | 7                  | 0                | 68                            | 0                                | 0                                 | 1                         |
| Private – Female       | 16                    | 1                  | 0                | 15                            | 0                                | 0                                 | 0                         |
| Private – Male         | 14                    | 0                  | 0                | 14                            | 0                                | 0                                 | 0                         |
| International – Female | 22                    | 1                  | 0                | 19                            | 0                                | 0                                 | 2                         |
| International – Male   | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| <b>Total</b>           | <b>232</b>            | <b>11</b>          | <b>0</b>         | <b>218</b>                    | <b>0</b>                         | <b>0</b>                          | <b>3</b>                  |



Table A D.3. Teacher participation status – Saudi Arabia, ISCED level 1

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 783        |
| Absent                  | 212          |
| Left school permanently | 70           |
| Not part of sample      | 5            |
| <b>Total</b>            | <b>4 070</b> |

### **Slovenia: ISCED level 1**

ISCED level 1 in Slovenia consists of “Basic education (grades 1-6)” and comprises Grades 1 to 6 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to reduce the number of big schools in the sample for overlap control.

*Sample sizes:* 30 schools were selected for the field trial; 264 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with equal probabilities for big schools; otherwise, systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 students in schools.

*Explicit stratification:* Organised by regions with four categories (central, northeast, southeast, west) and school size with two categories (big, small) for central, southeast and western regions.

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education, Science and Sport and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Slovenia, ISCED level 1**

| Explicit stratum          | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Northeast                 | 62                    | 0                  | 0                | 54                            | 0                                | 0                                 | 8                         |
| Southeast – Big schools   | 12                    | 0                  | 0                | 8                             | 0                                | 0                                 | 4                         |
| Southeast – Small schools | 52                    | 0                  | 0                | 37                            | 3                                | 0                                 | 12                        |
| Central – Big schools     | 36                    | 0                  | 0                | 26                            | 0                                | 0                                 | 10                        |
| Central – Small schools   | 39                    | 0                  | 0                | 29                            | 0                                | 0                                 | 10                        |
| West – Big schools        | 25                    | 0                  | 0                | 21                            | 0                                | 0                                 | 4                         |
| West – Small schools      | 38                    | 0                  | 0                | 28                            | 0                                | 0                                 | 10                        |
| <b>Total</b>              | <b>264</b>            | <b>0</b>           | <b>0</b>         | <b>203</b>                    | <b>3</b>                         | <b>0</b>                          | <b>58</b>                 |

**Table A D.2. School participation status: survey of teachers – Slovenia, ISCED level 1**

| Explicit stratum          | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Northeast                 | 62                    | 0                  | 0                | 55                            | 0                                | 0                                 | 7                         |
| Southeast – Big schools   | 12                    | 0                  | 0                | 11                            | 0                                | 0                                 | 1                         |
| Southeast – Small schools | 52                    | 0                  | 0                | 37                            | 3                                | 0                                 | 12                        |
| Central – Big schools     | 36                    | 0                  | 0                | 28                            | 0                                | 0                                 | 8                         |
| Central – Small schools   | 39                    | 0                  | 0                | 33                            | 0                                | 0                                 | 6                         |
| West – Big schools        | 25                    | 0                  | 0                | 21                            | 0                                | 0                                 | 4                         |
| West – Small schools      | 38                    | 0                  | 0                | 32                            | 0                                | 0                                 | 6                         |
| <b>Total</b>              | <b>264</b>            | <b>0</b>           | <b>0</b>         | <b>217</b>                    | <b>3</b>                         | <b>0</b>                          | <b>44</b>                 |

Table A D.3. Teacher participation status – Slovenia, ISCED level 1

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 615        |
| Absent                  | 343          |
| Left school permanently | 7            |
| Not part of sample      | 15           |
| <b>Total</b>            | <b>3 980</b> |

### Spain: ISCED level 1

ISCED level 1 in Spain consists of “Primary education” and comprises Grades 1 to 6 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between some of the communities.

*Sample sizes:* 30 schools were selected for the field trial; 506 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by community with nine categories (Andalusia, Asturias, Balearic Islands, Canary Islands, Cantabria, Catalonia, La Rioja, Valencian Community, other communities), overlap with two categories (ISCED level 1 only, ISCED levels 02 and 1) and overlap with four categories (with ISCED level 2, without ISCED level 2, big schools without ISCED level 2, small schools without ISCED level 2) for Cantabria and La Rioja ISCED levels 02 and 1 schools.

*Implicit stratification:* Organised by community with 18 categories and funding with two categories (public, private) for ISCED levels 02 and 1 schools.

*Data sources:* Data used for school sampling were obtained from the autonomous communities and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Spain, ISCED level 1**

| Explicit stratum                                                | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Andalusia – ISCED 1 only                                        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Andalusia – ISCED 02 and ISCED 1                                | 42                    | 0                  | 0                | 42                            | 0                                | 0                                 | 0                         |
| Asturias – ISCED 1 only                                         | 7                     | 0                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| Asturias – ISCED 02 and ISCED 1                                 | 44                    | 0                  | 0                | 44                            | 0                                | 0                                 | 0                         |
| Balearic Islands – ISCED 1 only                                 | 6                     | 0                  | 0                | 6                             | 0                                | 0                                 | 0                         |
| Balearic Islands – ISCED 02 and ISCED 1                         | 44                    | 0                  | 0                | 44                            | 0                                | 0                                 | 0                         |
| Canary Islands – ISCED 1 only                                   | 6                     | 1                  | 0                | 4                             | 0                                | 0                                 | 1                         |
| Canary Islands – ISCED 02 and ISCED 1                           | 44                    | 0                  | 0                | 40                            | 0                                | 0                                 | 4                         |
| Cantabria – ISCED 1 only                                        | 5                     | 0                  | 0                | 5                             | 0                                | 0                                 | 0                         |
| Cantabria – ISCED 02 and ISCED 1 – With ISCED 2                 | 12                    | 0                  | 0                | 9                             | 0                                | 0                                 | 3                         |
| Cantabria – ISCED 02 and ISCED 1 – Without ISCED 2              | 34                    | 0                  | 0                | 33                            | 0                                | 0                                 | 1                         |
| Catalonia – ISCED 1 only                                        | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Catalonia – ISCED 02 and ISCED 1                                | 42                    | 0                  | 0                | 39                            | 0                                | 0                                 | 3                         |
| La Rioja – ISCED 1 only                                         | 1                     | 1                  | 0                | 0                             | 0                                | 0                                 | 0                         |
| La Rioja – ISCED 02 and ISCED 1 – With ISCED 2                  | 11                    | 0                  | 0                | 11                            | 0                                | 0                                 | 0                         |
| La Rioja – ISCED 02 and ISCED 1 – Big schools without ISCED 2   | 16                    | 0                  | 0                | 15                            | 0                                | 0                                 | 1                         |
| La Rioja – ISCED 02 and ISCED 1 – Small schools without ISCED 2 | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Valencian Community – ISCED 1 only                              | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Valencian Community – ISCED 02 and ISCED 1                      | 42                    | 0                  | 0                | 42                            | 0                                | 0                                 | 0                         |

| Explicit stratum                         | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Other communities – ISCED 1 only         | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Other communities – ISCED 02 and ISCED 1 | 96                    | 0                  | 0                | 94                            | 0                                | 0                                 | 2                         |
| <b>Total</b>                             | <b>506</b>            | <b>2</b>           | <b>0</b>         | <b>487</b>                    | <b>0</b>                         | <b>0</b>                          | <b>17</b>                 |

Table A D.2. School participation status: survey of teachers – Spain, ISCED level 1

| Explicit stratum                                                | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Andalusia – ISCED 1 only                                        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Andalusia – ISCED 02 and ISCED 1                                | 42                    | 0                  | 0                | 42                            | 0                                | 0                                 | 0                         |
| Asturias – ISCED 1 only                                         | 7                     | 0                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| Asturias – ISCED 02 and ISCED 1                                 | 44                    | 0                  | 0                | 44                            | 0                                | 0                                 | 0                         |
| Balearic Islands – ISCED 1 only                                 | 6                     | 0                  | 0                | 6                             | 0                                | 0                                 | 0                         |
| Balearic Islands – ISCED 02 and ISCED 1                         | 44                    | 0                  | 0                | 44                            | 0                                | 0                                 | 0                         |
| Canary Islands – ISCED 1 only                                   | 6                     | 1                  | 0                | 4                             | 0                                | 0                                 | 1                         |
| Canary Islands – ISCED 02 and ISCED 1                           | 44                    | 0                  | 0                | 44                            | 0                                | 0                                 | 0                         |
| Cantabria – ISCED 1 only                                        | 5                     | 0                  | 0                | 5                             | 0                                | 0                                 | 0                         |
| Cantabria – ISCED 02 and ISCED 1 – With ISCED 2                 | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Cantabria – ISCED 02 and ISCED 1 – Without ISCED 2              | 34                    | 0                  | 0                | 34                            | 0                                | 0                                 | 0                         |
| Catalonia – ISCED 1 only                                        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Catalonia – ISCED 02 and ISCED 1                                | 42                    | 0                  | 0                | 41                            | 0                                | 0                                 | 1                         |
| La Rioja – ISCED 1 only                                         | 1                     | 1                  | 0                | 0                             | 0                                | 0                                 | 0                         |
| La Rioja – ISCED 02 and ISCED 1 – With ISCED 2                  | 11                    | 0                  | 0                | 11                            | 0                                | 0                                 | 0                         |
| La Rioja – ISCED 02 and ISCED 1 – Big schools without ISCED 2   | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| La Rioja – ISCED 02 and ISCED 1 – Small schools without ISCED 2 | 22                    | 0                  | 0                | 22                            | 0                                | 0                                 | 0                         |
| Valencian Community – ISCED 1 only                              | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Valencian Community – ISCED 02 and ISCED 1                      | 42                    | 0                  | 0                | 42                            | 0                                | 0                                 | 0                         |
| Other communities – ISCED 1 only                                | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Other communities – ISCED 02 and ISCED 1                        | 96                    | 0                  | 0                | 95                            | 0                                | 0                                 | 1                         |
| <b>Total</b>                                                    | <b>506</b>            | <b>2</b>           | <b>0</b>         | <b>500</b>                    | <b>0</b>                         | <b>0</b>                          | <b>4</b>                  |

Table A D.3. Teacher participation status – Spain, ISCED level 1

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 8 060        |
| Absent                  | 447          |
| Left school permanently | 46           |
| Not part of sample      | 107          |
| <b>Total</b>            | <b>8 660</b> |

### Türkiye: ISCED level 1

ISCED level 1 in Türkiye consists of “Primary education” and “Music and ballet primary school” and comprises Grades 1 to 4 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 1 teachers, then adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 35 schools were selected for the field trial; 238 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by funding with 2 categories (public, private) and region with 12 categories for public schools.

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of National Education and referred to school year 2022/2023.

**Table A D.1. School participation status: survey of principals – Türkiye, ISCED level 1**

| Explicit stratum                      | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Istanbul Region              | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Public – West Marmara Region          | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Aegean Region                | 26                    | 0                  | 0                | 24                            | 0                                | 0                                 | 2                         |
| Public – East Marmara Region          | 20                    | 0                  | 0                | 19                            | 0                                | 0                                 | 1                         |
| Public – West Anatolia Region         | 20                    | 0                  | 0                | 20                            | 0                                | 0                                 | 0                         |
| Public – Mediterranean Region         | 32                    | 0                  | 0                | 32                            | 0                                | 0                                 | 0                         |
| Public – Central Anatolia Region      | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Public – West Black Sea Region        | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Public – East Black Sea Region        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Northeast Anatolia Region    | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Central East Anatolia Region | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Public – Southeast Anatolia Region    | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Private                               | 26                    | 0                  | 0                | 22                            | 0                                | 0                                 | 4                         |
| <b>Total</b>                          | <b>238</b>            | <b>0</b>           | <b>0</b>         | <b>231</b>                    | <b>0</b>                         | <b>0</b>                          | <b>7</b>                  |

**Table A D.2. School participation status: survey of teachers – Türkiye, ISCED level 1**

| Explicit stratum                 | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Istanbul Region         | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Public – West Marmara Region     | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Aegean Region           | 26                    | 0                  | 0                | 26                            | 0                                | 0                                 | 0                         |
| Public – East Marmara Region     | 20                    | 0                  | 0                | 19                            | 0                                | 0                                 | 1                         |
| Public – West Anatolia Region    | 20                    | 0                  | 0                | 19                            | 0                                | 0                                 | 1                         |
| Public – Mediterranean Region    | 32                    | 0                  | 0                | 31                            | 0                                | 0                                 | 1                         |
| Public – Central Anatolia Region | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |

| Explicit stratum                      | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – West Black Sea Region        | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Public – East Black Sea Region        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Northeast Anatolia Region    | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Central East Anatolia Region | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Public – Southeast Anatolia Region    | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| Private                               | 26                    | 0                  | 0                | 23                            | 0                                | 0                                 | 3                         |
| <b>Total</b>                          | <b>238</b>            | <b>0</b>           | <b>0</b>         | <b>232</b>                    | <b>0</b>                         | <b>0</b>                          | <b>6</b>                  |

**Table A D.3. Teacher participation status – Türkiye, ISCED level 1**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 053        |
| Absent                  | 155          |
| Left school permanently | 7            |
| Not part of sample      | 29           |
| <b>Total</b>            | <b>4 244</b> |

### United Arab Emirates: ISCED level 1

ISCED level 1 in the United Arab Emirates consists of “First cycle of basic education” and comprises Grades 1 to 4 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to improve overlap control between ISCED levels.

*Sample sizes:* 30 schools were selected for the field trial; 214 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 1 teachers in schools.

*Explicit stratification:* Organised by overlap with three categories (ISCED level 1 only; ISCED levels 1 and 2; ISCED levels 1, 2 and 3) and emirates with three categories (Abu Dhabi, Dubai, other emirates).

*Implicit stratification:* Organised by language with two categories (Arabic, English).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2023/24.

**Table A D.1. School participation status: survey of principals – United Arab Emirates, ISCED level 1**

| Explicit stratum                              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Abu Dhabi                      | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 only – Dubai                          | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 only – Other emirates                 | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Abu Dhabi               | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Dubai                   | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Other emirates          | 18                    | 6                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| ISCED 1, ISCED 2 and ISCED 3 – Abu Dhabi      | 44                    | 1                  | 0                | 43                            | 0                                | 0                                 | 0                         |
| ISCED 1, ISCED 2 and ISCED 3 – Dubai          | 52                    | 0                  | 0                | 51                            | 0                                | 0                                 | 1                         |
| ISCED 1, ISCED 2 and ISCED 3 – Other emirates | 56                    | 0                  | 0                | 56                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                                  | <b>214</b>            | <b>7</b>           | <b>0</b>         | <b>206</b>                    | <b>0</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.2. School participation status: survey of teachers – United Arab Emirates, ISCED level 1**

| Explicit stratum                         | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1 only – Abu Dhabi                 | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 only – Dubai                     | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 only – Other emirates            | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Abu Dhabi          | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Dubai              | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| ISCED 1 and ISCED 2 – Other emirates     | 18                    | 6                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| ISCED 1, ISCED 2 and ISCED 3 – Abu Dhabi | 44                    | 1                  | 0                | 43                            | 0                                | 0                                 | 0                         |



| Explicit stratum                              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1, ISCED 2 and ISCED 3 – Dubai          | 52                    | 0                  | 0                | 51                            | 0                                | 0                                 | 1                         |
| ISCED 1, ISCED 2 and ISCED 3 – Other emirates | 56                    | 0                  | 0                | 56                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                                  | <b>214</b>            | <b>7</b>           | <b>0</b>         | <b>206</b>                    | <b>0</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.3. Teacher participation status – United Arab Emirates, ISCED level 1**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 091        |
| Absent                  | 104          |
| Left school permanently | 9            |
| Not part of sample      | 5            |
| <b>Total</b>            | <b>4 209</b> |

## Characteristics of national samples, ISCED level 3

### Croatia: ISCED level 3

ISCED level 3 in Croatia consists of “Vocational education programmes within regular education in duration of one year, that enable access to labour market”, “Vocational education programmes within regular education system in duration up to two years, that enable access to labour market”, “Vocational education programmes within regular education system in duration of three or three years, that enable access to labour market or entry to ISCED level 03.08”, “Vocational education programmes within regular education system in duration of four or more years, that enable access to labour market or entry to ISCED levels 5 and 6”, “Art education – duration 4 years”, “Grammar secondary school educational programs – duration 4 years” and comprises Grades 9 to 14 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 3 students.

*Sample sizes:* 30 schools were selected for the field trial; 200 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 3 students in schools.

*Explicit stratification:* Organised by programme with four categories (four- or five-year vocational programme, vocational-industrial-crafts programme, mixed type, gymnasium).

*Implicit stratification:* Organised by region with six categories (Central Croatia, City of Zagreb, Eastern Croatia, Northern Croatia, Southern Croatia, Western Croatia).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2020/21.

**Table A D.1. School participation status: survey of principals – Croatia, ISCED level 3**

| Explicit stratum                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Four- or five-year vocational programme | 78                    | 0                  | 0                | 70                            | 0                                | 0                                 | 8                         |
| Vocational-industrial-crafts programme  | 40                    | 0                  | 0                | 36                            | 0                                | 0                                 | 4                         |
| Mixed type                              | 34                    | 0                  | 0                | 30                            | 0                                | 0                                 | 4                         |
| Gymnasium                               | 48                    | 0                  | 0                | 44                            | 0                                | 0                                 | 4                         |
| <b>Total</b>                            | <b>200</b>            | <b>0</b>           | <b>0</b>         | <b>180</b>                    | <b>0</b>                         | <b>0</b>                          | <b>20</b>                 |

**Table A D.2. School participation status: survey of teachers – Croatia, ISCED level 3**

| Explicit stratum                        | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Four- or five-year vocational programme | 78                    | 0                  | 0                | 75                            | 0                                | 0                                 | 3                         |
| Vocational-industrial-crafts programme  | 40                    | 0                  | 0                | 38                            | 0                                | 0                                 | 2                         |
| Mixed type                              | 34                    | 0                  | 0                | 32                            | 0                                | 0                                 | 2                         |
| Gymnasium                               | 48                    | 0                  | 0                | 47                            | 0                                | 0                                 | 1                         |

| Explicit stratum | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| <b>Total</b>     | <b>200</b>            | <b>0</b>           | <b>0</b>         | <b>192</b>                    | <b>0</b>                         | <b>0</b>                          | <b>8</b>                  |

**Table A D.3. Teacher participation status – Croatia, ISCED level 3**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 497        |
| Absent                  | 583          |
| Left school permanently | 35           |
| Not part of sample      | 13           |
| <b>Total</b>            | <b>4 128</b> |

### Denmark: ISCED level 3

The target population comprises metropolitan Denmark, not including the autonomous territories of the Faroe Islands and Greenland.

ISCED level 3 in Denmark consists of “PRE-International Baccalaureate”, “Upper secondary education”, “Admittance examinations for engineering programmes”, “Vocational educational training, basic course 1”, “Vocational educational training, basic course 2 and main course”, “Vocational educational training, others” and “Vocational educational training, basic course 2 and main course (access to higher level)” and comprises Grades 11 to 13 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between different programmes of vocational schools.

*Sample sizes:* 31 schools were selected for the field trial; 246 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 3 students in schools.

*Explicit stratification:* Organised by educational track with two categories (academic, vocational) and programme with seven categories (higher general examination programme, higher technical examination programme, higher commercial examination programme, care and health, mercantile, foods and farming, tech and building).

*Implicit stratification:* Organised by region with five categories (Capital Region of Denmark, Central Denmark Region, North Denmark Region, Region of Southern Denmark, Region Zealand).

*Data sources:* Data used for school sampling were obtained from the National Agency for IT and Learning and referred to school year 2020/21.

**Table A D.1. School participation status: survey of principals – Denmark, ISCED level 3**

| Explicit stratum                                   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Academic – Higher general examination programme    | 78                    | 0                  | 0                | 47                            | 16                               | 3                                 | 12                        |
| Academic – Higher technical examination programme  | 10                    | 1                  | 0                | 6                             | 2                                | 0                                 | 1                         |
| Academic – Higher commercial examination programme | 24                    | 0                  | 0                | 12                            | 5                                | 0                                 | 7                         |
| Vocational – Care and health                       | 30                    | 2                  | 0                | 18                            | 1                                | 0                                 | 9                         |
| Vocational – Mercantile                            | 30                    | 4                  | 0                | 17                            | 2                                | 0                                 | 7                         |
| Vocational – Foods and farming                     | 30                    | 3                  | 0                | 20                            | 3                                | 0                                 | 4                         |
| Vocational – Tech and building                     | 44                    | 2                  | 0                | 23                            | 3                                | 1                                 | 15                        |
| <b>Total</b>                                       | <b>246</b>            | <b>12</b>          | <b>0</b>         | <b>143</b>                    | <b>32</b>                        | <b>4</b>                          | <b>55</b>                 |

Table A D.2. School participation status: survey of teachers – Denmark, ISCED level 3

| Explicit stratum                                   | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|----------------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Academic – Higher general examination programme    | 78                    | 0                  | 0                | 47                            | 16                               | 3                                 | 12                        |
| Academic – Higher technical examination programme  | 10                    | 1                  | 0                | 6                             | 2                                | 0                                 | 1                         |
| Academic – Higher commercial examination programme | 24                    | 0                  | 0                | 12                            | 5                                | 0                                 | 7                         |
| Vocational – Care and health                       | 30                    | 2                  | 0                | 18                            | 1                                | 0                                 | 9                         |
| Vocational – Mercantile                            | 30                    | 4                  | 0                | 18                            | 2                                | 0                                 | 6                         |
| Vocational – Foods and farming                     | 30                    | 3                  | 0                | 20                            | 3                                | 0                                 | 4                         |
| Vocational – Tech and building                     | 44                    | 2                  | 0                | 23                            | 2                                | 1                                 | 16                        |
| <b>Total</b>                                       | <b>246</b>            | <b>12</b>          | <b>0</b>         | <b>144</b>                    | <b>31</b>                        | <b>4</b>                          | <b>55</b>                 |

Table A D.3. Teacher participation status – Denmark, ISCED level 3

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 550        |
| Absent                  | 360          |
| Left school permanently | 84           |
| Not part of sample      | 79           |
| <b>Total</b>            | <b>3 073</b> |

### ***Flemish Community (Belgium): ISCED level 3***

ISCED level 3 in Flemish Community (Belgium) consists of “Regular secondary education – 2<sup>nd</sup> stage ASO (ASO = general secondary education)”, “European School – regular secondary education – 2<sup>nd</sup> stage”, “Regular secondary education – 2<sup>nd</sup> stage KSO (KSO = artistic secondary education)”, “Regular secondary education – 2<sup>nd</sup> stage TSO (= technical secondary education) and BSO (= vocational secondary education; including modular education)”, “Regular secondary education – 3<sup>rd</sup> stage – 1<sup>st</sup> and 2<sup>nd</sup> year of the 3<sup>rd</sup> stage – ASO (general secondary education)”, “Regular secondary education – 3<sup>rd</sup> stage – 1<sup>st</sup> and 2<sup>nd</sup> year of the 3<sup>rd</sup> stage – KSO (artistic secondary education)”, “Regular secondary education – 3<sup>rd</sup> stage – 1<sup>st</sup> and 2<sup>nd</sup> year of the 3<sup>rd</sup> stage – BSO (vocational secondary education; including modular education)”, “Regular secondary education – 3<sup>rd</sup> stage – 1<sup>st</sup> and 2<sup>nd</sup> year of the 3<sup>rd</sup> stage – TSO (technical secondary education)”, “Regular secondary education – 3<sup>rd</sup> stage – 3<sup>rd</sup> year of the 3<sup>rd</sup> stage – BSO (vocational secondary education; including modular education)”, “Part-time vocational secondary education” and “Apprenticeship (organised by SYNTRA – Flemish Agency for Entrepreneurial Training)” and comprises Grades 9 to 11 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 3 teachers.

*Sample sizes:* 210 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 3 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED 2 only, ISCED 2 and ISCED 3) and funding with two categories (public, private).

*Implicit stratification:* Organised by educational network with three categories (education organised by the Flemish Community, government-aided public education, government-aided private education).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and Training and referred to school year 2022/23.

**Table A D.1. School participation status: survey of principals – Flemish Community (Belgium), ISCED level 3**

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 3 only – Public         | 22                    | 0                  | 0                | 16                            | 3                                | 1                                 | 2                         |
| ISCED 3 only – Private        | 40                    | 0                  | 0                | 17                            | 9                                | 3                                 | 11                        |
| ISCED 2 and ISCED 3 – Public  | 40                    | 0                  | 0                | 21                            | 3                                | 1                                 | 15                        |
| ISCED 2 and ISCED 3 – Private | 108                   | 0                  | 0                | 46                            | 17                               | 0                                 | 45                        |
| <b>Total</b>                  | <b>210</b>            | <b>0</b>           | <b>0</b>         | <b>100</b>                    | <b>32</b>                        | <b>5</b>                          | <b>73</b>                 |

**Table A D.2. School participation status: survey of teachers – Flemish Community (Belgium), ISCED level 3**

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 3 only – Public         | 22                    | 0                  | 0                | 16                            | 3                                | 1                                 | 2                         |
| ISCED 3 only – Private        | 40                    | 0                  | 0                | 17                            | 10                               | 1                                 | 12                        |
| ISCED 2 and ISCED 3 – Public  | 40                    | 0                  | 0                | 22                            | 2                                | 1                                 | 15                        |
| ISCED 2 and ISCED 3 – Private | 108                   | 0                  | 0                | 51                            | 17                               | 0                                 | 40                        |
| <b>Total</b>                  | <b>210</b>            | <b>0</b>           | <b>0</b>         | <b>106</b>                    | <b>32</b>                        | <b>3</b>                          | <b>69</b>                 |

**Table A D.3. Teacher participation status – Flemish Community (Belgium), ISCED level 3**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 427        |
| Absent                  | 380          |
| Left school permanently | 25           |
| Not part of sample      | 30           |
| <b>Total</b>            | <b>2 862</b> |

### Portugal: ISCED level 3

The target population comprises mainland Portugal, not including the Azores and Madeira.

ISCED level 3 in Portugal consists of “Upper secondary education – Regular – Scientific-humanistic courses”, “Upper secondary education – Regular – Technological courses”, “Upper secondary education – Specialised artistic courses (young-oriented programmes) – Music”, “Upper secondary education – Specialised artistic courses (young-oriented programmes) – Dance”, “Upper secondary education – Specialised artistic courses (young-oriented programmes) – Audiovisual and visual arts”, “Upper secondary education – Vocational courses”, “Upper secondary education – Apprenticeship courses”, “Upper secondary education – Education and training courses – Type 4”, “Upper secondary education – Education and training courses – Complementary training type”, “Upper secondary education – Education and training courses – Type 5”, “Upper secondary education – Education and training courses – Type 6” and “Upper secondary education – Education and training courses – Type 7” and comprises Grades 10 to 12 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between public and private schools.

*Sample sizes:* 31 schools were selected for the field trial; 206 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 3 teachers in schools.

*Explicit stratification:* Organised by overlap with two categories (ISCED 3 only, ISCED 2 and ISCED 3) and funding with two categories (public, private).

*Implicit stratification:* Organised by region with five categories (Alentejo, Algarve, Centre, Lisbon, North) for public schools.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2019/20.

**Table A D.1. School participation status: survey of principals – Portugal, ISCED level 3**

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 3 only – Public         | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 3 only – Private        | 20                    | 2                  | 0                | 17                            | 1                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Public  | 146                   | 1                  | 0                | 145                           | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Private | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                  | <b>206</b>            | <b>3</b>           | <b>0</b>         | <b>202</b>                    | <b>1</b>                         | <b>0</b>                          | <b>0</b>                  |

**Table A D.2. School participation status: survey of teachers – Portugal, ISCED level 3**

| Explicit stratum              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 3 only – Public         | 30                    | 0                  | 0                | 30                            | 0                                | 0                                 | 0                         |
| ISCED 3 only – Private        | 20                    | 2                  | 0                | 17                            | 1                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Public  | 146                   | 1                  | 0                | 145                           | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Private | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                  | <b>206</b>            | <b>3</b>           | <b>0</b>         | <b>202</b>                    | <b>1</b>                         | <b>0</b>                          | <b>0</b>                  |



Table A D.3. Teacher participation status – Portugal, ISCED level 3

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 878        |
| Absent                  | 253          |
| Left school permanently | 19           |
| Not part of sample      | 46           |
| <b>Total</b>            | <b>4 196</b> |

### Saudi Arabia: ISCED level 3

ISCED level 3 in Saudi Arabia consists of “General secondary education” and “Industrial secondary and building Institutes” and comprises Grades 10 to 12 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between public, private and international schools.

*Sample sizes:* 35 schools were selected for the field trial; 242 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 3 teachers in schools.

*Explicit stratification:* Organised by school type with three categories (public, private, international) and gender with two categories (female, male).

*Implicit stratification:* Organised by region with 13 categories.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to 2022.

**Table A D.1. School participation status: survey of principals – Saudi Arabia, ISCED level 3**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Female        | 96                    | 2                  | 0                | 89                            | 0                                | 0                                 | 5                         |
| Public – Male          | 86                    | 2                  | 0                | 78                            | 0                                | 0                                 | 6                         |
| Private – Female       | 12                    | 1                  | 0                | 10                            | 0                                | 0                                 | 1                         |
| Private – Male         | 18                    | 0                  | 0                | 17                            | 0                                | 0                                 | 1                         |
| International – Female | 16                    | 2                  | 0                | 10                            | 0                                | 0                                 | 4                         |
| International – Male   | 14                    | 1                  | 0                | 10                            | 0                                | 0                                 | 3                         |
| <b>Total</b>           | <b>242</b>            | <b>8</b>           | <b>0</b>         | <b>214</b>                    | <b>0</b>                         | <b>0</b>                          | <b>20</b>                 |

**Table A D.2. School participation status: survey of teachers – Saudi Arabia, ISCED level 3**

| Explicit stratum       | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Female        | 96                    | 2                  | 0                | 93                            | 0                                | 0                                 | 1                         |
| Public – Male          | 86                    | 2                  | 0                | 84                            | 0                                | 0                                 | 0                         |
| Private – Female       | 12                    | 1                  | 0                | 11                            | 0                                | 0                                 | 0                         |
| Private – Male         | 18                    | 0                  | 0                | 17                            | 0                                | 0                                 | 1                         |
| International – Female | 16                    | 2                  | 0                | 11                            | 0                                | 0                                 | 3                         |
| International – Male   | 14                    | 1                  | 0                | 10                            | 0                                | 0                                 | 3                         |
| <b>Total</b>           | <b>242</b>            | <b>8</b>           | <b>0</b>         | <b>226</b>                    | <b>0</b>                         | <b>0</b>                          | <b>8</b>                  |

**Table A D.3. Teacher participation status – Saudi Arabia, ISCED level 3**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 3 952        |
| Absent                  | 239          |
| Left school permanently | 77           |
| Not part of sample      | 3            |
| <b>Total</b>            | <b>4 271</b> |

### Slovenia: ISCED level 3

ISCED level 3 in Slovenia consists of “Short vocational upper secondary education”, “Vocational upper secondary education”, “Vocational-technical upper secondary education”, “Technical upper secondary education”, “General upper secondary education (general: *gimnazija* and classical *gimnazija*; *gimnazija* with specialisation: technical *gimnazija*, *gimnazija* of economics, *gimnazija* of art, international *gimnazija*)”, “Vocational course and vocational *matura*” and “Matura course and general *matura*” and comprises Grades 10 to 13 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Census.

*Sample sizes:* 30 schools were selected for the field trial; 144 schools were selected for the main survey.

*Method of sample selection:* Census.

*Measure of size:* Number of ISCED level 3 students in schools.

*Explicit stratification:* Organised by school type with two categories (gymnasium, technical and vocational school) and regions with four categories (central, northeast, southeast, west).

*Implicit stratification:* Not used.

*Data sources:* Data used for school sampling were obtained from the Ministry of Education, Science and Sport and referred to school year 2021/22.

**Table A D.1. School participation status: survey of principals – Slovenia, ISCED level 3**

| Explicit stratum                            | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Gymnasium – Northeast                       | 11                    | 0                  | 0                | 9                             | 0                                | 0                                 | 2                         |
| Gymnasium – Southeast                       | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Gymnasium – Central                         | 16                    | 1                  | 0                | 12                            | 0                                | 0                                 | 3                         |
| Gymnasium – West                            | 9                     | 0                  | 0                | 9                             | 0                                | 0                                 | 0                         |
| Technical and vocational school – Northeast | 26                    | 0                  | 0                | 20                            | 0                                | 0                                 | 6                         |
| Technical and vocational school – Southeast | 29                    | 2                  | 0                | 20                            | 0                                | 0                                 | 7                         |
| Technical and vocational school – Central   | 22                    | 0                  | 0                | 15                            | 0                                | 0                                 | 7                         |
| Technical and vocational school – West      | 23                    | 1                  | 0                | 11                            | 0                                | 0                                 | 11                        |
| <b>Total</b>                                | <b>144</b>            | <b>4</b>           | <b>0</b>         | <b>104</b>                    | <b>0</b>                         | <b>0</b>                          | <b>36</b>                 |

**Table A D.2. School participation status: survey of teachers – Slovenia, ISCED level 3**

| Explicit stratum                            | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Gymnasium – Northeast                       | 11                    | 0                  | 0                | 11                            | 0                                | 0                                 | 0                         |
| Gymnasium – Southeast                       | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Gymnasium – Central                         | 16                    | 1                  | 0                | 12                            | 0                                | 0                                 | 3                         |
| Gymnasium – West                            | 9                     | 0                  | 0                | 9                             | 0                                | 0                                 | 0                         |
| Technical and vocational school – Northeast | 26                    | 0                  | 0                | 21                            | 0                                | 0                                 | 5                         |

| Explicit stratum                            | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Technical and vocational school – Southeast | 29                    | 2                  | 0                | 22                            | 0                                | 0                                 | 5                         |
| Technical and vocational school – Central   | 22                    | 0                  | 0                | 18                            | 0                                | 0                                 | 4                         |
| Technical and vocational school – West      | 23                    | 1                  | 0                | 12                            | 0                                | 0                                 | 10                        |
| <b>Total</b>                                | <b>144</b>            | <b>4</b>           | <b>0</b>         | <b>113</b>                    | <b>0</b>                         | <b>0</b>                          | <b>27</b>                 |

**Table A D.3. Teacher participation status – Slovenia, ISCED level 3**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 2 717        |
| Absent                  | 539          |
| Left school permanently | 15           |
| Not part of sample      | 23           |
| <b>Total</b>            | <b>3 294</b> |

### Türkiye: ISCED level 3

ISCED level 3 in Türkiye consists of “General upper secondary school”, “Open high school”, “Music and stage arts high school”, “Vocational and technical upper secondary school”, “Vocational education centers”, “Anatolian imam and preacher high school”, “Open vocational high school” and “Imam and preacher open high school” and comprises Grades 9 to 12/13 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 3 teachers, then adjusted to select a minimum of eight schools in the smaller strata.

*Sample sizes:* 35 schools were selected for the field trial; 204 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 3 teachers in schools.

*Explicit stratification:* Organised by funding with two categories (public, private) and region with 12 categories for public schools.

*Implicit stratification:* Organised by school type with three categories (Anatolian high school, vocational high school, religious high school) for public schools.

*Data sources:* Data used for school sampling were obtained from the Ministry of National Education and referred to school year 2022/23.

**Table A D.1. School participation status: survey of principals – Türkiye, ISCED level 3**

| Explicit stratum                      | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Istanbul Region              | 24                    | 0                  | 0                | 23                            | 0                                | 0                                 | 1                         |
| Public – West Marmara Region          | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Aegean Region                | 20                    | 1                  | 0                | 19                            | 0                                | 0                                 | 0                         |
| Public – East Marmara Region          | 16                    | 0                  | 0                | 15                            | 0                                | 0                                 | 1                         |
| Public – West Anatolia Region         | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Public – Mediterranean Region         | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Public – Central Anatolia Region      | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Public – West Black Sea Region        | 12                    | 0                  | 0                | 10                            | 0                                | 0                                 | 2                         |
| Public – East Black Sea Region        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Northeast Anatolia Region    | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Central East Anatolia Region | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Public – Southeast Anatolia Region    | 20                    | 0                  | 0                | 20                            | 0                                | 0                                 | 0                         |
| Private                               | 28                    | 0                  | 0                | 26                            | 0                                | 0                                 | 2                         |
| <b>Total</b>                          | <b>204</b>            | <b>1</b>           | <b>0</b>         | <b>197</b>                    | <b>0</b>                         | <b>0</b>                          | <b>6</b>                  |

**Table A D.2. School participation status: survey of teachers – Türkiye, ISCED level 3**

| Explicit stratum             | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – Istanbul Region     | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Public – West Marmara Region | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Aegean Region       | 20                    | 1                  | 0                | 18                            | 0                                | 0                                 | 1                         |
| Public – East Marmara Region | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |

| Explicit stratum                      | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|---------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| Public – West Anatolia Region         | 16                    | 0                  | 0                | 16                            | 0                                | 0                                 | 0                         |
| Public – Mediterranean Region         | 24                    | 0                  | 0                | 24                            | 0                                | 0                                 | 0                         |
| Public – Central Anatolia Region      | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Public – West Black Sea Region        | 12                    | 0                  | 0                | 12                            | 0                                | 0                                 | 0                         |
| Public – East Black Sea Region        | 8                     | 0                  | 0                | 8                             | 0                                | 0                                 | 0                         |
| Public – Northeast Anatolia Region    | 8                     | 0                  | 0                | 7                             | 0                                | 0                                 | 1                         |
| Public – Central East Anatolia Region | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| Public – Southeast Anatolia Region    | 20                    | 0                  | 0                | 20                            | 0                                | 0                                 | 0                         |
| Private                               | 28                    | 0                  | 0                | 28                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                          | <b>204</b>            | <b>1</b>           | <b>0</b>         | <b>201</b>                    | <b>0</b>                         | <b>0</b>                          | <b>2</b>                  |

**Table A D.3. Teacher participation status – Türkiye, ISCED level 3**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 976        |
| Absent                  | 236          |
| Left school permanently | 11           |
| Not part of sample      | 23           |
| <b>Total</b>            | <b>5 246</b> |

### United Arab Emirates: ISCED level 3

ISCED level 3 in the United Arab Emirates consists of “General secondary cycle” and “Second cycle of vocational secondary” and comprises Grades 9 to 12 (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to improve overlap control between ISCED levels.

*Sample sizes:* 30 schools were selected for the field trial; 216 schools were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to school size.

*Measure of size:* Number of ISCED level 3 teachers in schools.

*Explicit stratification:* Organised by overlap with three categories (ISCED 3 only; ISCED 2 and ISCED 3; ISCED 1, ISCED 2 and ISCED 3) and emirates with three categories (Abu Dhabi, Dubai, other emirates).

*Implicit stratification:* Organised by language with two categories (Arabic, English).

*Data sources:* Data used for school sampling were obtained from the Ministry of Education and referred to school year 2023/24.

**Table A D.1. School participation status: survey of principals – United Arab Emirates, ISCED level 3**

| Explicit stratum                              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 3 only – Abu Dhabi                      | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| ISCED 3 only – Dubai                          | 2                     | 0                  | 0                | 2                             | 0                                | 0                                 | 0                         |
| ISCED 3 only – Other emirates                 | 4                     | 0                  | 0                | 4                             | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Abu Dhabi               | 14                    | 3                  | 0                | 11                            | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Dubai                   | 4                     | 0                  | 0                | 4                             | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Other emirates          | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| ISCED 1, ISCED 2 and ISCED 3 – Abu Dhabi      | 80                    | 6                  | 0                | 71                            | 0                                | 0                                 | 3                         |
| ISCED 1, ISCED 2 and ISCED 3 – Dubai          | 26                    | 0                  | 0                | 26                            | 0                                | 0                                 | 0                         |
| ISCED 1, ISCED 2 and ISCED 3 – Other emirates | 68                    | 5                  | 0                | 62                            | 0                                | 0                                 | 1                         |
| <b>Total</b>                                  | <b>216</b>            | <b>15</b>          | <b>0</b>         | <b>197</b>                    | <b>0</b>                         | <b>0</b>                          | <b>4</b>                  |

**Table A D.2. School participation status: survey of teachers – United Arab Emirates, ISCED level 3**

| Explicit stratum                         | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 3 only – Abu Dhabi                 | 8                     | 1                  | 0                | 7                             | 0                                | 0                                 | 0                         |
| ISCED 3 only – Dubai                     | 2                     | 0                  | 0                | 2                             | 0                                | 0                                 | 0                         |
| ISCED 3 only – Other emirates            | 4                     | 0                  | 0                | 4                             | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Abu Dhabi          | 14                    | 3                  | 0                | 11                            | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Dubai              | 4                     | 0                  | 0                | 4                             | 0                                | 0                                 | 0                         |
| ISCED 2 and ISCED 3 – Other emirates     | 10                    | 0                  | 0                | 10                            | 0                                | 0                                 | 0                         |
| ISCED 1, ISCED 2 and ISCED 3 – Abu Dhabi | 80                    | 6                  | 0                | 73                            | 0                                | 0                                 | 1                         |

| Explicit stratum                              | Total sampled schools | Ineligible schools | Excluded schools | Participating sampled schools | Participating first replacements | Participating second replacements | Non-participating schools |
|-----------------------------------------------|-----------------------|--------------------|------------------|-------------------------------|----------------------------------|-----------------------------------|---------------------------|
| ISCED 1, ISCED 2 and ISCED 3 – Dubai          | 26                    | 0                  | 0                | 26                            | 0                                | 0                                 | 0                         |
| ISCED 1, ISCED 2 and ISCED 3 – Other emirates | 68                    | 5                  | 0                | 63                            | 0                                | 0                                 | 0                         |
| <b>Total</b>                                  | <b>216</b>            | <b>15</b>          | <b>0</b>         | <b>200</b>                    | <b>0</b>                         | <b>0</b>                          | <b>1</b>                  |

**Table A D.3. Teacher participation status – United Arab Emirates, ISCED level 3**

| Participation status    | Teachers     |
|-------------------------|--------------|
| Participated            | 4 228        |
| Absent                  | 50           |
| Left school permanently | 11           |
| Not part of sample      | 1            |
| <b>Total</b>            | <b>4 290</b> |



## Characteristics of national samples, ISCED level 02

### Chile: ISCED level 02

ISCED level 02 in Chile consists of “Pre-primary education (upper middle level, 1st transition level and 2nd transition level)” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 02 children, then adjusted to select a minimum of eight settings in the smaller strata.

*Sample sizes:* 50 settings were selected for the field trial; 205 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of ISCED level 02 children in settings.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 02 only, ISCED levels 02 and 2), by setting type with seven categories (public school, private school with public funds, private school, Integra kindergarten, Junji kindergarten, private kindergarten, public funds delegated administration kindergarten) and size with two categories (small schools, big schools) for ISCED level 02 and ISCED level 2 settings.

*Implicit stratification:* Not used.

*Data sources:* Data used for setting sampling were obtained from the Undersecretariat of Early Childhood Education and referred to 2021.

**Table A D.1. Setting participation status: survey of leaders – Chile, ISCED level 02**

| Explicit stratum                                                        | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-------------------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only – Public school                                           | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| ISCED 02 only – Private school with public funds                        | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| ISCED 02 only – Private school                                          | 8                      | 2                   | 0                 | 3                              | 1                                | 0                                 | 2                          |
| ISCED 02 only – Integra kindergarten                                    | 14                     | 2                   | 0                 | 11                             | 1                                | 0                                 | 0                          |
| ISCED 02 only – Junji kindergarten                                      | 10                     | 0                   | 0                 | 9                              | 0                                | 0                                 | 1                          |
| ISCED 02 only – Private kindergarten                                    | 8                      | 0                   | 0                 | 6                              | 0                                | 1                                 | 1                          |
| ISCED 02 only – Public funds, delegated administration kindergarten     | 16                     | 1                   | 0                 | 13                             | 1                                | 1                                 | 0                          |
| ISCED 02 and ISCED 2 – Public school – Small schools                    | 30                     | 0                   | 0                 | 25                             | 4                                | 0                                 | 1                          |
| ISCED 02 and ISCED 2 – Public school – Big schools                      | 16                     | 0                   | 0                 | 8                              | 1                                | 0                                 | 7                          |
| ISCED 02 and ISCED 2 – Private school with public funds – Small schools | 26                     | 1                   | 1                 | 15                             | 3                                | 1                                 | 5                          |
| ISCED 02 and ISCED 2 – Private school with public funds – Big schools   | 39                     | 0                   | 0                 | 20                             | 6                                | 1                                 | 12                         |
| ISCED 02 and ISCED 2 – Private school – Small schools                   | 8                      | 1                   | 0                 | 4                              | 1                                | 0                                 | 2                          |
| ISCED 02 and ISCED 2 – Private school – Big schools                     | 14                     | 0                   | 0                 | 6                              | 2                                | 1                                 | 5                          |
| <b>Total</b>                                                            | <b>205</b>             | <b>8</b>            | <b>1</b>          | <b>135</b>                     | <b>20</b>                        | <b>5</b>                          | <b>36</b>                  |

Table A D.2. Setting participation status: survey of staff – Chile, ISCED level 02

| Explicit stratum                                                        | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-------------------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only – Public school                                           | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| ISCED 02 only – Private school with public funds                        | 8                      | 1                   | 0                 | 6                              | 0                                | 0                                 | 1                          |
| ISCED 02 only – Private school                                          | 8                      | 2                   | 0                 | 2                              | 1                                | 0                                 | 3                          |
| ISCED 02 only – Integra kindergarten                                    | 14                     | 2                   | 0                 | 9                              | 1                                | 0                                 | 2                          |
| ISCED 02 only – Junji kindergarten                                      | 10                     | 0                   | 0                 | 9                              | 0                                | 0                                 | 1                          |
| ISCED 02 only – Private kindergarten                                    | 8                      | 0                   | 0                 | 6                              | 0                                | 0                                 | 2                          |
| ISCED 02 only – Public funds, delegated administration kindergarten     | 16                     | 1                   | 0                 | 12                             | 1                                | 1                                 | 1                          |
| ISCED 02 and ISCED 2 – Public school – Small schools                    | 30                     | 0                   | 0                 | 23                             | 5                                | 0                                 | 2                          |
| ISCED 02 and ISCED 2 – Public school – Big schools                      | 16                     | 0                   | 0                 | 8                              | 2                                | 0                                 | 6                          |
| ISCED 02 and ISCED 2 – Private school with public funds – Small schools | 26                     | 1                   | 1                 | 13                             | 3                                | 1                                 | 7                          |
| ISCED 02 and ISCED 2 – Private school with public funds – Big schools   | 39                     | 0                   | 0                 | 14                             | 5                                | 1                                 | 19                         |
| ISCED 02 and ISCED 2 – Private school – Small schools                   | 8                      | 1                   | 0                 | 4                              | 0                                | 0                                 | 3                          |
| ISCED 02 and ISCED 2 – Private school – Big schools                     | 14                     | 0                   | 0                 | 5                              | 2                                | 1                                 | 6                          |
| <b>Total</b>                                                            | <b>205</b>             | <b>8</b>            | <b>1</b>          | <b>119</b>                     | <b>20</b>                        | <b>4</b>                          | <b>53</b>                  |

Table A D.3. Staff participation status – Chile, ISCED level 02

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 741        |
| Absent                   | 100        |
| Left setting permanently | 0          |
| Not part of sample       | 0          |
| <b>Total</b>             | <b>841</b> |

### Colombia: ISCED level 02

ISCED level 02 in Colombia consists of “Early childhood educational development” and “Pre-primary level: grades of pre-K, Kindergarten and transition (or grade zero)” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 02 children.

*Sample sizes:* 42 settings were selected for the field trial; 230 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of ISCED level 02 children in settings.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 02 only, ISCED levels 02 and 2), funding with two categories (public, private), urbanisation with two categories (urban, rural) for public schools and responsibility with two categories (Colombian Institute for Family Welfare [ICBF], Ministry of National Education [SIMAT MEN]).

*Implicit stratification:* Not used.

*Data sources:* Data used for setting sampling were obtained from the Colombian Institute for Family Welfare and the Ministry of National Education and referred to 2023.

**Table A D.1. Setting participation status: survey of leaders – Colombia, ISCED level 02**

| Explicit stratum                                  | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only – Public – Urban – ICBF             | 98                     | 0                   | 0                 | 50                             | 10                               | 2                                 | 36                         |
| ISCED 02 only – Public – Urban – SIMAT MEN        | 28                     | 0                   | 0                 | 17                             | 4                                | 0                                 | 7                          |
| ISCED 02 only – Public – Rural – ICBF             | 16                     | 0                   | 0                 | 7                              | 1                                | 0                                 | 8                          |
| ISCED 02 only – Public – Rural – SIMAT MEN        | 14                     | 0                   | 0                 | 7                              | 2                                | 0                                 | 5                          |
| ISCED 02 only – Private – SIMAT MEN               | 22                     | 0                   | 0                 | 4                              | 7                                | 1                                 | 10                         |
| ISCED 02 and ISCED 2 – Public – Urban – SIMAT MEN | 24                     | 0                   | 0                 | 20                             | 1                                | 0                                 | 3                          |
| ISCED 02 and ISCED 2 – Public – Rural – SIMAT MEN | 10                     | 0                   | 0                 | 6                              | 1                                | 0                                 | 3                          |
| ISCED 02 and ISCED 2 – Private – SIMAT MEN        | 18                     | 0                   | 0                 | 16                             | 1                                | 0                                 | 1                          |
| <b>Total</b>                                      | <b>230</b>             | <b>0</b>            | <b>0</b>          | <b>127</b>                     | <b>27</b>                        | <b>3</b>                          | <b>73</b>                  |

**Table A D.2. Setting participation status: survey of staff – Colombia, ISCED level 02**

| Explicit stratum                           | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|--------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only – Public – Urban – ICBF      | 98                     | 0                   | 0                 | 48                             | 8                                | 2                                 | 40                         |
| ISCED 02 only – Public – Urban – SIMAT MEN | 28                     | 0                   | 0                 | 17                             | 4                                | 0                                 | 7                          |
| ISCED 02 only – Public – Rural – ICBF      | 16                     | 0                   | 0                 | 6                              | 1                                | 0                                 | 9                          |

| Explicit stratum                                  | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only – Public – Rural – SIMAT MEN        | 14                     | 0                   | 0                 | 7                              | 2                                | 0                                 | 5                          |
| ISCED 02 only – Private – SIMAT MEN               | 22                     | 0                   | 0                 | 5                              | 7                                | 0                                 | 10                         |
| ISCED 02 and ISCED 2 – Public – Urban – SIMAT MEN | 24                     | 0                   | 0                 | 20                             | 1                                | 0                                 | 3                          |
| ISCED 02 and ISCED 2 – Public – Rural – SIMAT MEN | 10                     | 0                   | 0                 | 6                              | 1                                | 0                                 | 3                          |
| ISCED 02 and ISCED 2 – Private – SIMAT MEN        | 18                     | 0                   | 0                 | 14                             | 1                                | 0                                 | 3                          |
| <b>Total</b>                                      | <b>230</b>             | <b>0</b>            | <b>0</b>          | <b>123</b>                     | <b>25</b>                        | <b>2</b>                          | <b>80</b>                  |

**Table A D.3. Staff participation status – Colombia, ISCED level 02**

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 553        |
| Absent                   | 27         |
| Left setting permanently | 2          |
| Not part of sample       | 0          |
| <b>Total</b>             | <b>582</b> |

### Denmark: ISCED level 02

The target population comprises metropolitan Denmark, not including the autonomous territories of the Faroe Islands and Greenland.

ISCED level 02 in Denmark consists of “Kindergarten” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between small, medium-sized and large settings.

*Sample sizes:* 30 settings were selected for the field trial; 186 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of ISCED level 02 children in settings.

*Explicit stratification:* Organised by size with three categories (small setting, medium-sized setting, large setting).

*Implicit stratification:* Organised by funding with three categories (public, self-governing, private).

*Data sources:* Data used for setting sampling were obtained from the National Agency for IT and Learning and referred to 2020.

**Table A D.1. Setting participation status: survey of leaders – Denmark, ISCED level 02**

| Explicit stratum      | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-----------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Small settings        | 30                     | 2                   | 0                 | 12                             | 7                                | 3                                 | 6                          |
| Medium-sized settings | 80                     | 1                   | 0                 | 42                             | 12                               | 12                                | 13                         |
| Large settings        | 76                     | 1                   | 0                 | 47                             | 9                                | 6                                 | 13                         |
| <b>Total</b>          | <b>186</b>             | <b>4</b>            | <b>0</b>          | <b>101</b>                     | <b>28</b>                        | <b>21</b>                         | <b>32</b>                  |

**Table A D.2. Setting participation status: survey of staff – Denmark, ISCED level 02**

| Explicit stratum      | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-----------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Small settings        | 30                     | 2                   | 0                 | 12                             | 8                                | 3                                 | 5                          |
| Medium-sized settings | 80                     | 1                   | 0                 | 41                             | 11                               | 12                                | 15                         |
| Large settings        | 76                     | 1                   | 0                 | 47                             | 8                                | 6                                 | 14                         |
| <b>Total</b>          | <b>186</b>             | <b>4</b>            | <b>0</b>          | <b>100</b>                     | <b>27</b>                        | <b>21</b>                         | <b>34</b>                  |

**Table A D.3. Staff participation status – Denmark, ISCED level 02**

| Participation status     | Staff        |
|--------------------------|--------------|
| Participated             | 946          |
| Absent                   | 111          |
| Left setting permanently | 41           |
| Not part of sample       | 59           |
| <b>Total</b>             | <b>1 157</b> |

### Finland: ISCED level 02

ISCED level 02 in Finland consists of “Centre-based early childhood education and care [ECEC] activities (3-5 year-old children)”, “Family day care (3-5 year-old children)” and “Pre-primary education for 6-year-old children in ECEC centres and comprehensive schools” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>). Family day care settings are home-based settings that do not belong to the Teaching and Learning International Survey (TALIS) ISCED level 02 target population.

*Sample allocation:* Disproportional allocation to allow comparisons between Finnish and Swedish settings and between urban/semi-urban and rural settings.

*Sample sizes:* 32 settings were selected for the field trial; 220 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of ISCED level 02 children in settings.

*Explicit stratification:* Organised by language with two categories (Finnish, Swedish), by region with four categories (Helsinki/Uusimaa, Northern and Eastern, Southern, Western) for Finnish schools and by urbanisation with two categories (urban and semi-urban, rural) for Finnish schools in Northern and Eastern, Southern, and Western and for Swedish schools.

*Implicit stratification:* Organised by region with four categories (Eastern, Northern, Lapland, Western and Inland,) for Finnish settings in Northern and Eastern.

*Data sources:* Data used for setting sampling were obtained from Statistics Finland and the Finnish National Agency for Education and referred to 2022.

**Table A D.1. Setting participation status: survey of leaders – Finland, ISCED level 02**

| Explicit stratum                                      | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Finnish – Helsinki/Uusimaa                            | 62                     | 3                   | 0                 | 53                             | 5                                | 0                                 | 1                          |
| Finnish – Southern – Urban and semi-urban             | 30                     | 0                   | 0                 | 27                             | 2                                | 0                                 | 1                          |
| Finnish – Southern – Rural                            | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Finnish – Western – Urban and semi-urban              | 38                     | 2                   | 0                 | 32                             | 2                                | 0                                 | 2                          |
| Finnish – Western – Rural                             | 8                      | 0                   | 0                 | 7                              | 0                                | 0                                 | 1                          |
| Finnish – Northern and Eastern – Urban and semi-urban | 32                     | 1                   | 0                 | 30                             | 1                                | 0                                 | 0                          |
| Finnish – Northern and Eastern – Rural                | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| Swedish – Urban and semi-urban                        | 26                     | 1                   | 0                 | 24                             | 0                                | 0                                 | 1                          |
| Swedish – Rural                                       | 8                      | 2                   | 0                 | 6                              | 0                                | 0                                 | 0                          |
| <b>Total</b>                                          | <b>220</b>             | <b>10</b>           | <b>0</b>          | <b>194</b>                     | <b>10</b>                        | <b>0</b>                          | <b>6</b>                   |

Table A D.2. Setting participation status: survey of staff – Finland, ISCED level 02

| Explicit stratum                                      | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Finnish – Helsinki/Uusimaa                            | 62                     | 3                   | 0                 | 53                             | 5                                | 0                                 | 1                          |
| Finnish – Southern – Urban and semi-urban             | 30                     | 0                   | 0                 | 27                             | 2                                | 0                                 | 1                          |
| Finnish – Southern – Rural                            | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Finnish – Western – Urban and semi-urban              | 38                     | 2                   | 0                 | 32                             | 2                                | 0                                 | 2                          |
| Finnish – Western – Rural                             | 8                      | 0                   | 0                 | 7                              | 0                                | 0                                 | 1                          |
| Finnish – Northern and Eastern – Urban and semi-urban | 32                     | 1                   | 0                 | 30                             | 1                                | 0                                 | 0                          |
| Finnish – Northern and Eastern – Rural                | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| Swedish – Urban and semi-urban                        | 26                     | 1                   | 0                 | 24                             | 0                                | 0                                 | 1                          |
| Swedish – Rural                                       | 8                      | 2                   | 0                 | 6                              | 0                                | 0                                 | 0                          |
| <b>Total</b>                                          | <b>220</b>             | <b>10</b>           | <b>0</b>          | <b>194</b>                     | <b>10</b>                        | <b>0</b>                          | <b>6</b>                   |

Table A D.3. Staff participation status – Finland, ISCED level 02

| Participation status     | Staff        |
|--------------------------|--------------|
| Participated             | 1 386        |
| Absent                   | 67           |
| Left setting permanently | 30           |
| Not part of sample       | 42           |
| <b>Total</b>             | <b>1 525</b> |

### **Flemish Community (Belgium): ISCED level 02**

ISCED level 02 in the Flemish Community of Belgium consists of “European school – regular nursery education” and “Regular nursery education” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 02 staff.

*Sample sizes:* 190 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of ISCED level 02 staff in settings.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 02 only, ISCED levels 02 and 1) and educational network with three categories (education organised by the Flemish Community, government-aided public education, government-aided private education) for ISCED levels 02 and 1 schools.

*Implicit stratification:* Organised by funding with two categories (public, private).

*Data sources:* Data used for setting sampling were obtained from the Ministry of Education and Training and referred to school year 2022/23.

**Table A D.1. Setting participation status: survey of leaders – Flemish Community (Belgium), ISCED level 02**

| Explicit stratum                                                    | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only                                                       | 18                     | 0                   | 0                 | 11                             | 3                                | 1                                 | 3                          |
| ISCED 02 and ISCED 1 – Education organised by the Flemish Community | 30                     | 0                   | 0                 | 20                             | 4                                | 1                                 | 5                          |
| ISCED 02 and ISCED 1 – Government-aided public education            | 38                     | 0                   | 0                 | 27                             | 5                                | 1                                 | 5                          |
| ISCED 02 and ISCED 1 – Government-aided private education           | 104                    | 0                   | 0                 | 64                             | 17                               | 4                                 | 19                         |
| <b>Total</b>                                                        | <b>190</b>             | <b>0</b>            | <b>0</b>          | <b>122</b>                     | <b>29</b>                        | <b>7</b>                          | <b>32</b>                  |

**Table A D.2. Setting participation status: survey of staff – Flemish Community (Belgium), ISCED level 02**

| Explicit stratum                                                    | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only                                                       | 18                     | 0                   | 0                 | 11                             | 3                                | 1                                 | 3                          |
| ISCED 02 and ISCED 1 – Education organised by the Flemish Community | 30                     | 0                   | 0                 | 21                             | 5                                | 1                                 | 3                          |
| ISCED 02 and ISCED 1 – Government-aided public education            | 38                     | 0                   | 0                 | 27                             | 5                                | 1                                 | 5                          |
| ISCED 02 and ISCED 1 – Government-aided private education           | 104                    | 0                   | 0                 | 67                             | 17                               | 5                                 | 15                         |
| <b>Total</b>                                                        | <b>190</b>             | <b>0</b>            | <b>0</b>          | <b>126</b>                     | <b>30</b>                        | <b>8</b>                          | <b>26</b>                  |



Table A D.3. Staff participation status – Flemish Community (Belgium), ISCED level 02

| Participation status     | Staff        |
|--------------------------|--------------|
| Participated             | 1 143        |
| Absent                   | 135          |
| Left setting permanently | 4            |
| Not part of sample       | 15           |
| <b>Total</b>             | <b>1 297</b> |

### Germany: ISCED level 02

ISCED level 02 in Germany consists of “Kindergarten”, “Mixed-age settings (for children aged 3 years to school entry)”, “Family day care (for children aged 3 years to school entry)”, “School kindergarten” and “Preschool classes” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>). Family day care settings are home-based settings that do not belong to the TALIS ISCED level 02 target population.

*Sample allocation:* Proportional to the number of ISCED level 02 settings, then adjusted to select a minimum of eight settings in the smaller strata.

*Sample sizes:* 36 settings were selected for the field trial; 210 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with equal probabilities.

*Measure of size:* None.

*Explicit stratification:* Organised by region with two categories (Eastern Germany, Western Germany) and funding with three categories (public, private, missing information).

*Implicit stratification:* Organised by state with 16 categories and provider with eight categories (public providers, the Workers' Welfare Association [AWO] or affiliated organisations, the German Red Cross or affiliated organisations, providers affiliated to the Protestant Church, providers affiliated to the Catholic Church, other private non-profit providers, private for-profit providers, missing information).

*Data sources:* Data used for setting sampling were obtained from the 16 German states and referred to 2022.

**Table A D.1. Setting participation status: survey of leaders – Germany, ISCED level 02**

| Explicit stratum                                        | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| U3 and ISCED 02 – Eastern Germany – Public              | 10                     | 0                   | 0                 | 4                              | 1                                | 0                                 | 5                          |
| U3 and ISCED 02 – Eastern Germany – Private             | 22                     | 0                   | 0                 | 11                             | 2                                | 2                                 | 7                          |
| U3 and ISCED 02 – Eastern Germany – Missing information | 10                     | 1                   | 0                 | 4                              | 3                                | 1                                 | 1                          |
| U3 and ISCED 02 – Western Germany – Public              | 50                     | 2                   | 0                 | 21                             | 7                                | 6                                 | 14                         |
| U3 and ISCED 02 – Western Germany – Private             | 110                    | 9                   | 0                 | 46                             | 13                               | 13                                | 29                         |
| U3 and ISCED 02 – Western Germany – Missing information | 8                      | 1                   | 0                 | 3                              | 1                                | 0                                 | 3                          |
| <b>Total</b>                                            | <b>210</b>             | <b>13</b>           | <b>0</b>          | <b>89</b>                      | <b>27</b>                        | <b>22</b>                         | <b>59</b>                  |

**Table A D.2. Setting participation status: survey of staff – Germany, ISCED level 02**

| Explicit stratum                                        | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| U3 and ISCED 02 – Eastern Germany – Public              | 10                     | 0                   | 0                 | 4                              | 1                                | 0                                 | 5                          |
| U3 and ISCED 02 – Eastern Germany – Private             | 22                     | 0                   | 0                 | 11                             | 2                                | 3                                 | 6                          |
| U3 and ISCED 02 – Eastern Germany – Missing information | 10                     | 1                   | 0                 | 4                              | 3                                | 1                                 | 1                          |

| Explicit stratum                                        | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| U3 and ISCED 02 – Western Germany – Public              | 50                     | 2                   | 0                 | 22                             | 6                                | 6                                 | 14                         |
| U3 and ISCED 02 – Western Germany – Private             | 110                    | 9                   | 0                 | 49                             | 14                               | 12                                | 26                         |
| U3 and ISCED 02 – Western Germany – Missing information | 8                      | 1                   | 0                 | 3                              | 1                                | 0                                 | 3                          |
| <b>Total</b>                                            | <b>210</b>             | <b>13</b>           | <b>0</b>          | <b>93</b>                      | <b>27</b>                        | <b>22</b>                         | <b>55</b>                  |

**Table A D.3. Staff participation status – Germany, ISCED level 02**

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 810        |
| Absent                   | 175        |
| Left setting permanently | 11         |
| Not part of sample       | 3          |
| <b>Total</b>             | <b>999</b> |

### Ireland: ISCED level 02

ISCED level 02 in Ireland consists of “Early start” and “Privately provided pre-primary education – Early Childhood Care and Education Scheme and the Community Childcare Subvention Programme” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between deprivation categories.

*Sample sizes:* 40 settings were selected for the field trial; 200 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of places in settings.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 02 only, U3 and ISCED level 02) and deprivation with three categories (disadvantaged, average, affluent). Additional strata with self-representing replacements were created after the survey administration; these replacements would have replaced other participating settings.

*Implicit stratification:* Organised by region with three categories (Eastern and Midland Region, Northern and Western Region, Southern Region) and urbanisation with two categories (urban, rural).

*Data sources:* Data used for setting sampling were obtained from the Child and Family Agency and referred to 2023.

**Table A D.1. Setting participation status: survey of leaders – Ireland, ISCED level 02**

| Explicit stratum                                    | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-----------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only – Disadvantaged                       | 8                      | 0                   | 0                 | 3                              | 0                                | 0                                 | 5                          |
| ISCED 02 only – Average                             | 40                     | 0                   | 0                 | 16                             | 5                                | 4                                 | 15                         |
| ISCED 02 only – Affluent                            | 8                      | 0                   | 0                 | 3                              | 1                                | 2                                 | 2                          |
| U3 and ISCED 02 – Disadvantaged                     | 22                     | 0                   | 0                 | 9                              | 6                                | 2                                 | 5                          |
| U3 and ISCED 02 – Average                           | 94                     | 2                   | 0                 | 33                             | 13                               | 9                                 | 37                         |
| U3 and ISCED 02 – Affluent                          | 28                     | 1                   | 0                 | 7                              | 2                                | 3                                 | 15                         |
| ISCED 02 only – Disadvantaged – Self-representing   | 2                      | 0                   | 0                 | 0                              | 1                                | 1                                 | 0                          |
| ISCED 02 only – Average – Self-representing         | 9                      | 0                   | 0                 | 0                              | 2                                | 7                                 | 0                          |
| U3 and ISCED 02 – Disadvantaged – Self-representing | 5                      | 0                   | 0                 | 0                              | 2                                | 3                                 | 0                          |
| U3 and ISCED 02 – Average – Self-representing       | 16                     | 0                   | 0                 | 0                              | 3                                | 11                                | 2                          |
| U3 and ISCED 02 – Affluent – Self-representing      | 1                      | 0                   | 0                 | 0                              | 0                                | 1                                 | 0                          |
| <b>Total</b>                                        | <b>233</b>             | <b>3</b>            | <b>0</b>          | <b>71</b>                      | <b>35</b>                        | <b>43</b>                         | <b>81</b>                  |

**Table A D.2. Setting participation status: survey of staff – Ireland, ISCED level 02**

| Explicit stratum              | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only – Disadvantaged | 8                      | 0                   | 0                 | 5                              | 0                                | 0                                 | 3                          |
| ISCED 02 only – Average       | 40                     | 0                   | 0                 | 19                             | 5                                | 5                                 | 11                         |

| Explicit stratum                                    | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-----------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only – Affluent                            | 8                      | 0                   | 0                 | 3                              | 1                                | 2                                 | 2                          |
| U3 and ISCED 02 – Disadvantaged                     | 22                     | 0                   | 0                 | 8                              | 7                                | 2                                 | 5                          |
| U3 and ISCED 02 – Average                           | 94                     | 2                   | 0                 | 38                             | 16                               | 10                                | 28                         |
| U3 and ISCED 02 – Affluent                          | 28                     | 1                   | 0                 | 9                              | 3                                | 4                                 | 11                         |
| ISCED 02 only – Disadvantaged – Self-representing   | 2                      | 0                   | 0                 | 0                              | 1                                | 1                                 | 0                          |
| ISCED 02 only – Average – Self-representing         | 9                      | 0                   | 0                 | 0                              | 2                                | 7                                 | 0                          |
| U3 and ISCED 02 – Disadvantaged – Self-representing | 5                      | 0                   | 0                 | 0                              | 2                                | 3                                 | 0                          |
| U3 and ISCED 02 – Average – Self-representing       | 16                     | 0                   | 0                 | 0                              | 3                                | 13                                | 0                          |
| U3 and ISCED 02 – Affluent – Self-representing      | 1                      | 0                   | 0                 | 0                              | 0                                | 1                                 | 0                          |
| <b>Total</b>                                        | <b>233</b>             | <b>3</b>            | <b>0</b>          | <b>82</b>                      | <b>40</b>                        | <b>48</b>                         | <b>60</b>                  |

**Table A D.3. Staff participation status – Ireland, ISCED level 02**

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 690        |
| Absent                   | 225        |
| Left setting permanently | 3          |
| Not part of sample       | 3          |
| <b>Total</b>             | <b>921</b> |

### Israel: ISCED level 02

ISCED level 02 in Israel consists of “Pre-primary education, public (supervised by Ministry of Education)”, “Pre-primary education – government-dependent private institutions (supervised by Ministry of Labor)” and “Pre-primary education – private institutions” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to oversample specific orientations.

*Sample sizes:* 60 settings were selected for the field trial; 416 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with equal probabilities.

*Measure of size:* None.

*Explicit stratification:* Organised by orientation with six categories (Hebrew secular, Hebrew religious, Arabic Arab, Arabic Druze, Arabic Bedouin, Hebrew ultra-Orthodox) and gender with three categories (male, female, mixed) for Hebrew ultra-Orthodox.

*Implicit stratification:* Organised by region with two categories (north, south) for Arabic Bedouin, socio-economic status with three categories (low, medium, high) for Hebrew secular, Hebrew religious, Arabic Arab, Arabic Druze and Hebrew ultra-Orthodox and age with two categories (not including age 5, including age 5).

*Data sources:* Data used for setting sampling were obtained from the Ministry of Education and referred to school year 2023/24.

*Weighting:* The strata “Hebrew ultra-Orthodox – Male”, “Hebrew ultra-Orthodox – Female” and “Hebrew ultra-Orthodox – Mixed” were treated as excluded because few settings participated.

**Table A D.1. Setting participation status: survey of leaders – Israel, ISCED level 02**

| Explicit stratum               | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|--------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Hebrew secular                 | 158                    | 4                   | 0                 | 131                            | 13                               | 0                                 | 10                         |
| Hebrew religious               | 82                     | 2                   | 0                 | 65                             | 5                                | 0                                 | 10                         |
| Arabic Arab                    | 44                     | 0                   | 0                 | 43                             | 1                                | 0                                 | 0                          |
| Arabic Druze                   | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Arabic Bedouin                 | 24                     | 1                   | 0                 | 19                             | 0                                | 0                                 | 4                          |
| Hebrew ultra-Orthodox – Male   | 48                     | 0                   | 48                | 0                              | 0                                | 0                                 | 0                          |
| Hebrew ultra-Orthodox – Female | 44                     | 0                   | 44                | 0                              | 0                                | 0                                 | 0                          |
| Hebrew ultra-Orthodox – Mixed  | 8                      | 0                   | 8                 | 0                              | 0                                | 0                                 | 0                          |
| <b>Total</b>                   | <b>416</b>             | <b>7</b>            | <b>100</b>        | <b>266</b>                     | <b>19</b>                        | <b>0</b>                          | <b>24</b>                  |

**Table A D.2. Setting participation status: survey of staff – Israel, ISCED level 02**

| Explicit stratum             | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Hebrew secular               | 158                    | 4                   | 0                 | 133                            | 13                               | 0                                 | 8                          |
| Hebrew religious             | 82                     | 2                   | 0                 | 67                             | 6                                | 0                                 | 7                          |
| Arabic Arab                  | 44                     | 0                   | 0                 | 43                             | 1                                | 0                                 | 0                          |
| Arabic Druze                 | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Arabic Bedouin               | 24                     | 1                   | 0                 | 20                             | 0                                | 0                                 | 3                          |
| Hebrew ultra-Orthodox – Male | 48                     | 0                   | 48                | 0                              | 0                                | 0                                 | 0                          |

| Explicit stratum               | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|--------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Hebrew ultra-Orthodox – Female | 44                     | 0                   | 44                | 0                              | 0                                | 0                                 | 0                          |
| Hebrew ultra-Orthodox – Mixed  | 8                      | 0                   | 8                 | 0                              | 0                                | 0                                 | 0                          |
| <b>Total</b>                   | <b>416</b>             | <b>7</b>            | <b>100</b>        | <b>271</b>                     | <b>20</b>                        | <b>0</b>                          | <b>18</b>                  |

**Table A D.3. Staff participation status – Israel, ISCED level 02**

| Participation status     | Staff        |
|--------------------------|--------------|
| Participated             | 1 153        |
| Absent                   | 186          |
| Left setting permanently | 0            |
| Not part of sample       | 1            |
| <b>Total</b>             | <b>1 340</b> |

### Japan: ISCED level 02

ISCED level 02 in Japan consists of “Integrated centre for early childhood education and care”, “Kindergarten” and “Day care centre” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between setting types and between public and private settings.

*Sample sizes:* 33 settings were selected for the field trial; 200 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of ISCED level 02 staff in settings.

*Explicit stratification:* Organised by setting type with three categories (kindergarten, nursery centre, centre of ECEC) and by funding with two categories (public, private).

*Implicit stratification:* Organised by urbanisation with two categories (major city, no major city).

*Data sources:* Data used for setting sampling were obtained from the Ministry of Education, Culture, Sports, Science and Technology, the Ministry of Health, Labour and Welfare and the Cabinet Office and referred to 2021.

**Table A D.1. Setting participation status: survey of leaders – Japan, ISCED level 02**

| Explicit stratum         | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|--------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Kindergarten – Public    | 30                     | 1                   | 0                 | 22                             | 5                                | 1                                 | 1                          |
| Kindergarten – Private   | 30                     | 0                   | 0                 | 15                             | 5                                | 7                                 | 3                          |
| Nursery centre – Public  | 30                     | 0                   | 0                 | 23                             | 7                                | 0                                 | 0                          |
| Nursery centre – Private | 40                     | 0                   | 0                 | 24                             | 11                               | 2                                 | 3                          |
| Centre of ECEC – Public  | 30                     | 0                   | 0                 | 28                             | 1                                | 1                                 | 0                          |
| Centre of ECEC – Private | 40                     | 0                   | 0                 | 30                             | 6                                | 1                                 | 3                          |
| <b>Total</b>             | <b>200</b>             | <b>1</b>            | <b>0</b>          | <b>142</b>                     | <b>35</b>                        | <b>12</b>                         | <b>10</b>                  |

**Table A D.2. Setting participation status: survey of staff – Japan, ISCED level 02**

| Explicit stratum         | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|--------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Kindergarten – Public    | 30                     | 1                   | 0                 | 22                             | 5                                | 1                                 | 1                          |
| Kindergarten – Private   | 30                     | 0                   | 0                 | 15                             | 5                                | 7                                 | 3                          |
| Nursery centre – Public  | 30                     | 0                   | 0                 | 23                             | 7                                | 0                                 | 0                          |
| Nursery centre – Private | 40                     | 0                   | 0                 | 24                             | 11                               | 2                                 | 3                          |
| Centre of ECEC – Public  | 30                     | 0                   | 0                 | 28                             | 1                                | 1                                 | 0                          |
| Centre of ECEC – Private | 40                     | 0                   | 0                 | 30                             | 6                                | 1                                 | 3                          |
| <b>Total</b>             | <b>200</b>             | <b>1</b>            | <b>0</b>          | <b>142</b>                     | <b>35</b>                        | <b>12</b>                         | <b>10</b>                  |



Table A D.3. Staff participation status – Japan, ISCED level 02

| Participation status     | Staff        |
|--------------------------|--------------|
| Participated             | 1 283        |
| Absent                   | 14           |
| Left setting permanently | 5            |
| Not part of sample       | 12           |
| <b>Total</b>             | <b>1 314</b> |

### Morocco: ISCED level 02

ISCED level 02 in Morocco consists of “*Enseignement préscolaire*” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between regions.

*Sample sizes:* 60 settings were selected for the field trial; 500 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with equal probabilities.

*Measure of size:* None.

*Explicit stratification:* Organised by region with ten categories.

*Implicit stratification:* Organised by setting type with four categories (public, private, unstructured schools, schools with partnership) and urbanisation with two categories (urban, rural).

*Data sources:* Data used for setting sampling were obtained from the Ministry of National Education and referred to school year 2021/22.

**Table A D.1. Setting participation status: survey of leaders – Morocco, ISCED level 02**

| Explicit stratum          | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Tanger-Tetouan-Al Hoceima | 54                     | 6                   | 0                 | 42                             | 5                                | 0                                 | 1                          |
| Oriental                  | 34                     | 4                   | 0                 | 30                             | 0                                | 0                                 | 0                          |
| Fès-Meknès                | 54                     | 6                   | 0                 | 48                             | 0                                | 0                                 | 0                          |
| Rabat-Salé-Kénitra        | 58                     | 8                   | 0                 | 42                             | 7                                | 0                                 | 1                          |
| Béni Mellal-Khénifra      | 34                     | 3                   | 0                 | 30                             | 0                                | 0                                 | 1                          |
| Casablanca-Settat         | 74                     | 5                   | 0                 | 69                             | 0                                | 0                                 | 0                          |
| Marrakech-Safi            | 68                     | 7                   | 0                 | 55                             | 4                                | 0                                 | 2                          |
| Drâa-Tafilalet            | 38                     | 7                   | 0                 | 31                             | 0                                | 0                                 | 0                          |
| Souss-Massa               | 56                     | 15                  | 0                 | 35                             | 5                                | 0                                 | 1                          |
| South                     | 30                     | 2                   | 0                 | 25                             | 1                                | 0                                 | 2                          |
| <b>Total</b>              | <b>500</b>             | <b>63</b>           | <b>0</b>          | <b>407</b>                     | <b>22</b>                        | <b>0</b>                          | <b>8</b>                   |

**Table A D.2. Setting participation status: survey of staff – Morocco, ISCED level 02**

| Explicit stratum          | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Tanger-Tetouan-Al Hoceima | 54                     | 6                   | 0                 | 42                             | 5                                | 0                                 | 1                          |
| Oriental                  | 34                     | 4                   | 0                 | 29                             | 0                                | 0                                 | 1                          |
| Fès-Meknès                | 54                     | 6                   | 0                 | 47                             | 0                                | 0                                 | 1                          |
| Rabat-Salé-Kénitra        | 58                     | 8                   | 0                 | 42                             | 7                                | 0                                 | 1                          |
| Béni Mellal-Khénifra      | 34                     | 3                   | 0                 | 30                             | 0                                | 0                                 | 1                          |
| Casablanca-Settat         | 74                     | 5                   | 0                 | 69                             | 0                                | 0                                 | 0                          |
| Marrakech-Safi            | 68                     | 7                   | 0                 | 55                             | 4                                | 0                                 | 2                          |
| Drâa-Tafilalet            | 38                     | 7                   | 0                 | 31                             | 0                                | 0                                 | 0                          |
| Souss-Massa               | 56                     | 15                  | 0                 | 35                             | 5                                | 0                                 | 1                          |
| South                     | 30                     | 2                   | 0                 | 26                             | 1                                | 0                                 | 1                          |
| <b>Total</b>              | <b>500</b>             | <b>63</b>           | <b>0</b>          | <b>406</b>                     | <b>22</b>                        | <b>0</b>                          | <b>9</b>                   |

Table A D.3. Staff participation status – Morocco, ISCED level 02

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 954        |
| Absent                   | 9          |
| Left setting permanently | 13         |
| Not part of sample       | 3          |
| <b>Total</b>             | <b>979</b> |

## New Zealand: ISCED level 02

The target population comprises New Zealand, not including the associated states Cook Islands and Niue or the dependent territory Tokelau.

ISCED level 02 in New Zealand consists of “Centre-based early childhood education” and “Kōhanga Reo” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between setting types.

*Sample sizes:* 57 settings were selected for the field trial; 216 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of staff in ISCED level 02 settings.

*Explicit stratification:* Organised by overlap with two categories (ISCED level 02 only, U3 and ISCED level 02) and setting type with four categories (education and care service, free kindergarten, playcentre, Te Kōhanga Reo [Māori language immersion environment for children and families]) for U3 and ISCED level 02 settings.

*Implicit stratification:* Organised by setting type with three categories (education and care service, free kindergarten, Te Kōhanga Reo [Māori language immersion environment for children and families]) for ISCED level 02 only settings and region with four categories (central northern, central southern, northern, southern).

*Data sources:* Data used for setting sampling were obtained from the Ministry of Education and referred to 2022.

*Weighting:* Due to very low participation rates, it was decided to calculate weights without non-response adjustments. The resulting outcomes represent the part of the population that would have participated in TALIS, given they were sampled. Stratum “U3 and ISCED level 02 – Te Kōhanga Reo (Māori language immersion environment for children and families)” was treated as excluded because no setting participated.

**Table A D.1. Setting participation status: survey of leaders – New Zealand, ISCED level 02**

| Explicit stratum                                                                                  | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only                                                                                     | 18                     | 0                   | 0                 | 4                              | 0                                | 1                                 | 13                         |
| U3 and ISCED 02 – Education and care service                                                      | 108                    | 2                   | 0                 | 25                             | 2                                | 1                                 | 78                         |
| U3 and ISCED 02 – Free kindergarten                                                               | 30                     | 0                   | 0                 | 1                              | 1                                | 0                                 | 28                         |
| U3 and ISCED 02 – Playcentre                                                                      | 30                     | 0                   | 0                 | 3                              | 0                                | 0                                 | 27                         |
| U3 and ISCED 02 – Te Kōhanga Reo (Māori language immersion environment for children and families) | 30                     | 1                   | 29                | 0                              | 0                                | 0                                 | 0                          |
| <b>Total</b>                                                                                      | <b>216</b>             | <b>3</b>            | <b>29</b>         | <b>33</b>                      | <b>3</b>                         | <b>2</b>                          | <b>146</b>                 |

Table A D.2. Setting participation status: survey of staff – New Zealand, ISCED level 02

| Explicit stratum                                                                                  | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| ISCED 02 only                                                                                     | 18                     | 0                   | 0                 | 5                              | 0                                | 1                                 | 12                         |
| U3 and ISCED 02 – Education and care service                                                      | 108                    | 2                   | 0                 | 22                             | 2                                | 0                                 | 82                         |
| U3 and ISCED 02 – Free kindergarten                                                               | 30                     | 0                   | 0                 | 1                              | 1                                | 0                                 | 28                         |
| U3 and ISCED 02 – Playcentre                                                                      | 30                     | 0                   | 0                 | 3                              | 0                                | 0                                 | 27                         |
| U3 and ISCED 02 – Te Kōhanga Reo (Māori language immersion environment for children and families) | 30                     | 1                   | 29                | 0                              | 0                                | 0                                 | 0                          |
| <b>Total</b>                                                                                      | <b>216</b>             | <b>3</b>            | <b>29</b>         | <b>31</b>                      | <b>3</b>                         | <b>1</b>                          | <b>149</b>                 |

Table A D.3. Staff participation status – New Zealand, ISCED level 02

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 163        |
| Absent                   | 60         |
| Left setting permanently | 2          |
| Not part of sample       | 0          |
| <b>Total</b>             | <b>225</b> |

### Norway: ISCED level 02

ISCED level 02 in Norway consists of “Kindergartens and family kindergartens, 3-5 years” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>). Family kindergartens are home-based settings that do not belong to the TALIS ISCED level 02 target population.

*Sample allocation:* Proportional to the number of staff, then adjusted to select a minimum of eight settings in the smaller strata.

*Sample sizes:* 33 settings were selected for the field trial; 191 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of staff in ISCED level 02 settings.

*Explicit stratification:* Organised by funding with two categories (public, private) and number of inhabitants with three categories (fewer than 5 000 inhabitants, 5 000 to 19 999 inhabitants, 20 000 or more inhabitants).

*Implicit stratification:* Organised by region with four categories (Central and Northern Norway, Eastern Norway, Greater Oslo Region, Southern and Western Norway.).

*Data sources:* Data used for setting sampling were obtained from the Norwegian Directorate for Education and Training and referred to 2021.

**Table A D.1. Setting participation status: survey of leaders – Norway, ISCED level 02**

| Explicit stratum                       | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Public – Fewer than 5 000 inhabitants  | 12                     | 0                   | 0                 | 5                              | 1                                | 2                                 | 4                          |
| Public – 5 000 to 19 999 inhabitants   | 25                     | 1                   | 0                 | 10                             | 3                                | 1                                 | 10                         |
| Public – 20 000 or more inhabitants    | 60                     | 2                   | 0                 | 17                             | 5                                | 1                                 | 35                         |
| Private – Fewer than 5 000 inhabitants | 8                      | 1                   | 0                 | 2                              | 0                                | 0                                 | 5                          |
| Private – 5 000 to 19 999 inhabitants  | 18                     | 0                   | 0                 | 6                              | 0                                | 2                                 | 10                         |
| Private – 20 000 or more inhabitants   | 68                     | 1                   | 0                 | 17                             | 9                                | 3                                 | 38                         |
| <b>Total</b>                           | <b>191</b>             | <b>5</b>            | <b>0</b>          | <b>57</b>                      | <b>18</b>                        | <b>9</b>                          | <b>102</b>                 |

**Table A D.2. Setting participation status: survey of staff – Norway, ISCED level 02**

| Explicit stratum                       | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Public – Fewer than 5 000 inhabitants  | 12                     | 0                   | 0                 | 4                              | 1                                | 2                                 | 5                          |
| Public – 5 000 to 19 999 inhabitants   | 25                     | 1                   | 0                 | 10                             | 2                                | 0                                 | 12                         |
| Public – 20 000 or more inhabitants    | 60                     | 2                   | 0                 | 13                             | 3                                | 1                                 | 41                         |
| Private – Fewer than 5 000 inhabitants | 8                      | 1                   | 0                 | 1                              | 0                                | 0                                 | 6                          |
| Private – 5 000 to 19 999 inhabitants  | 18                     | 0                   | 0                 | 6                              | 0                                | 2                                 | 10                         |
| Private – 20 000 or more inhabitants   | 68                     | 1                   | 0                 | 13                             | 7                                | 3                                 | 44                         |
| <b>Total</b>                           | <b>191</b>             | <b>5</b>            | <b>0</b>          | <b>47</b>                      | <b>13</b>                        | <b>8</b>                          | <b>118</b>                 |

Table A D.3. Staff participation status – Norway, ISCED level 02

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 377        |
| Absent                   | 145        |
| Left setting permanently | 0          |
| Not part of sample       | 0          |
| <b>Total</b>             | <b>522</b> |

### Spain: ISCED level 02

ISCED level 02 in Spain consists of “Early childhood education – Second cycle” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to allow comparisons between some of the communities.

*Sample sizes:* 32 settings were selected for the field trial; 498 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of ISCED level 02 staff in settings.

*Explicit stratification:* Organised by community with nine categories (Andalusia, Asturias, Balearic Islands, Canary Islands, Cantabria, Catalonia, La Rioja, Valencian Community, other communities), overlap with two categories (ISCED level 02 only, ISCED levels 02 and 1) and overlap with four categories (with ISCED level 2, without ISCED level 2, big schools without ISCED level 2, small schools without ISCED level 2) for Cantabria and La Rioja ISCED levels 02 and 1 schools.

*Implicit stratification:* Organised by community with 18 categories and funding with 2 categories (public, private) for ISCED levels 02 and 1 school.

*Data sources:* Data used for setting sampling were obtained from the autonomous communities and referred to school year 2021/22.

**Table A D.1. Setting participation status: survey of leaders – Spain, ISCED level 02**

| Explicit stratum                                                | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-----------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Andalusia – ISCED 02 only                                       | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Andalusia – ISCED 02 and ISCED 1                                | 42                     | 0                   | 0                 | 41                             | 0                                | 0                                 | 1                          |
| Asturias – ISCED 02 only                                        | 5                      | 0                   | 0                 | 5                              | 0                                | 0                                 | 0                          |
| Asturias – ISCED 02 and ISCED 1                                 | 46                     | 0                   | 0                 | 46                             | 0                                | 0                                 | 0                          |
| Balearic Islands – ISCED 02 only                                | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Balearic Islands – ISCED 02 and ISCED 1                         | 42                     | 0                   | 0                 | 42                             | 0                                | 0                                 | 0                          |
| Canary Islands – ISCED 02 only                                  | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| Canary Islands – ISCED 02 and ISCED 1                           | 42                     | 2                   | 0                 | 38                             | 0                                | 0                                 | 2                          |
| Cantabria – ISCED 02 only                                       | 8                      | 0                   | 0                 | 7                              | 0                                | 0                                 | 1                          |
| Cantabria – ISCED 02 and ISCED 1 – With ISCED 2                 | 9                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 1                          |
| Cantabria – ISCED 02 and ISCED 1 – Without ISCED 2              | 34                     | 0                   | 0                 | 34                             | 0                                | 0                                 | 0                          |
| Catalonia – ISCED 02 only                                       | 8                      | 3                   | 0                 | 5                              | 0                                | 0                                 | 0                          |
| Catalonia – ISCED 02 and ISCED 1                                | 42                     | 1                   | 0                 | 41                             | 0                                | 0                                 | 0                          |
| La Rioja – ISCED 02 only                                        | 1                      | 0                   | 0                 | 1                              | 0                                | 0                                 | 0                          |
| La Rioja – ISCED 02 and ISCED 1 – With ISCED 2                  | 12                     | 0                   | 0                 | 12                             | 0                                | 0                                 | 0                          |
| La Rioja – ISCED 02 and ISCED 1 – Big schools without ISCED 2   | 16                     | 0                   | 0                 | 15                             | 0                                | 0                                 | 1                          |
| La Rioja – ISCED 02 and ISCED 1 – Small schools without ISCED 2 | 21                     | 0                   | 0                 | 21                             | 0                                | 0                                 | 0                          |
| Valencian Community – ISCED 02 only                             | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Valencian Community – ISCED 02 and ISCED 1                      | 42                     | 0                   | 0                 | 42                             | 0                                | 0                                 | 0                          |



| Explicit stratum                         | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Other communities – ISCED 02 only        | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| Other communities – ISCED 02 and ISCED 1 | 88                     | 0                   | 0                 | 85                             | 0                                | 0                                 | 3                          |
| <b>Total</b>                             | <b>498</b>             | <b>8</b>            | <b>0</b>          | <b>481</b>                     | <b>0</b>                         | <b>0</b>                          | <b>9</b>                   |

Table A D.2. Setting participation status: survey of staff – Spain, ISCED level 02

| Explicit stratum                                                | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-----------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Andalusia – ISCED 02 only                                       | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Andalusia – ISCED 02 and ISCED 1                                | 42                     | 0                   | 0                 | 42                             | 0                                | 0                                 | 0                          |
| Asturias – ISCED 02 only                                        | 5                      | 0                   | 0                 | 5                              | 0                                | 0                                 | 0                          |
| Asturias – ISCED 02 and ISCED 1                                 | 46                     | 0                   | 0                 | 46                             | 0                                | 0                                 | 0                          |
| Balearic Islands – ISCED 02 only                                | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Balearic Islands – ISCED 02 and ISCED 1                         | 42                     | 0                   | 0                 | 42                             | 0                                | 0                                 | 0                          |
| Canary Islands – ISCED 02 only                                  | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| Canary Islands – ISCED 02 and ISCED 1                           | 42                     | 2                   | 0                 | 40                             | 0                                | 0                                 | 0                          |
| Cantabria – ISCED 02 only                                       | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Cantabria – ISCED 02 and ISCED 1 – With ISCED 2                 | 9                      | 0                   | 0                 | 9                              | 0                                | 0                                 | 0                          |
| Cantabria – ISCED 02 and ISCED 1 – Without ISCED 2              | 34                     | 0                   | 0                 | 34                             | 0                                | 0                                 | 0                          |
| Catalonia – ISCED 02 only                                       | 8                      | 3                   | 0                 | 5                              | 0                                | 0                                 | 0                          |
| Catalonia – ISCED 02 and ISCED 1                                | 42                     | 1                   | 0                 | 41                             | 0                                | 0                                 | 0                          |
| La Rioja – ISCED 02 only                                        | 1                      | 0                   | 0                 | 1                              | 0                                | 0                                 | 0                          |
| La Rioja – ISCED 02 and ISCED 1 – With ISCED 2                  | 12                     | 0                   | 0                 | 12                             | 0                                | 0                                 | 0                          |
| La Rioja – ISCED 02 and ISCED 1 – Big schools without ISCED 2   | 16                     | 0                   | 0                 | 16                             | 0                                | 0                                 | 0                          |
| La Rioja – ISCED 02 and ISCED 1 – Small schools without ISCED 2 | 21                     | 0                   | 0                 | 21                             | 0                                | 0                                 | 0                          |
| Valencian Community – ISCED 02 only                             | 8                      | 0                   | 0                 | 7                              | 0                                | 0                                 | 1                          |
| Valencian Community – ISCED 02 and ISCED 1                      | 42                     | 0                   | 0                 | 42                             | 0                                | 0                                 | 0                          |
| Other communities – ISCED 02 only                               | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| Other communities – ISCED 02 and ISCED 1                        | 88                     | 0                   | 0                 | 88                             | 0                                | 0                                 | 0                          |
| <b>Total</b>                                                    | <b>498</b>             | <b>8</b>            | <b>0</b>          | <b>489</b>                     | <b>0</b>                         | <b>0</b>                          | <b>1</b>                   |

Table A D.3. Staff participation status – Spain, ISCED level 02

| Participation status     | Staff        |
|--------------------------|--------------|
| Participated             | 3 576        |
| Absent                   | 122          |
| Left setting permanently | 11           |
| Not part of sample       | 57           |
| <b>Total</b>             | <b>3 766</b> |

### Sweden: ISCED level 02

ISCED level 02 in Sweden consists of “Preschool classes” and “Preschool, for children 3 years of age or older” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Disproportional allocation to increase the sample size for pre-schools and allow comparisons between pre-schools and pre-school classes.

*Sample sizes:* 38 settings were selected for the field trial; 218 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of ISCED level 02 children in settings.

*Explicit stratification:* Organised by setting type with three categories (pre-school, pre-school class, pre-school class and ISCED level 2 school) and funding with two categories (public, private).

*Implicit stratification:* Not used.

*Data sources:* Data used for setting sampling were obtained from the Swedish National Agency for Education and referred to school year 2021/22.

**Table A D.1. Setting participation status: survey of leaders – Sweden, ISCED level 02**

| Explicit stratum                             | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Preschool – Public                           | 142                    | 3                   | 0                 | 128                            | 2                                | 0                                 | 9                          |
| Preschool – Private                          | 38                     | 0                   | 0                 | 38                             | 0                                | 0                                 | 0                          |
| Preschool class – Public                     | 14                     | 1                   | 0                 | 12                             | 0                                | 0                                 | 1                          |
| Preschool class – Private                    | 8                      | 0                   | 0                 | 6                              | 0                                | 0                                 | 2                          |
| Preschool class and ISCED 2 school – Public  | 8                      | 0                   | 0                 | 5                              | 0                                | 0                                 | 3                          |
| Preschool class and ISCED 2 school – Private | 8                      | 1                   | 0                 | 6                              | 0                                | 0                                 | 1                          |
| <b>Total</b>                                 | <b>218</b>             | <b>5</b>            | <b>0</b>          | <b>195</b>                     | <b>2</b>                         | <b>0</b>                          | <b>16</b>                  |

**Table A D.2. Setting participation status: survey of staff – Sweden, ISCED level 02**

| Explicit stratum                             | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Preschool – Public                           | 142                    | 3                   | 0                 | 135                            | 2                                | 0                                 | 2                          |
| Preschool – Private                          | 38                     | 0                   | 0                 | 37                             | 0                                | 0                                 | 1                          |
| Preschool class – Public                     | 14                     | 1                   | 0                 | 13                             | 0                                | 0                                 | 0                          |
| Preschool class – Private                    | 8                      | 0                   | 0                 | 7                              | 0                                | 0                                 | 1                          |
| Preschool class and ISCED 2 school – Public  | 8                      | 0                   | 0                 | 7                              | 0                                | 0                                 | 1                          |
| Preschool class and ISCED 2 school – Private | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| <b>Total</b>                                 | <b>218</b>             | <b>5</b>            | <b>0</b>          | <b>206</b>                     | <b>2</b>                         | <b>0</b>                          | <b>5</b>                   |

Table A D.3. Staff participation status – Sweden, ISCED level 02

| Participation status     | Staff        |
|--------------------------|--------------|
| Participated             | 1 219        |
| Absent                   | 198          |
| Left setting permanently | 18           |
| Not part of sample       | 31           |
| <b>Total</b>             | <b>1 466</b> |

### Türkiye: ISCED level 02

ISCED level 02 in Türkiye consists of “Pre-primary education (ages 3-5)” (UNESCO Institute of Statistics, 2017<sup>[1]</sup>).

*Sample allocation:* Proportional to the number of ISCED level 02 staff, then adjusted to select a minimum of eight settings in the smaller strata.

*Sample sizes:* 59 settings were selected for the field trial; 278 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of ISCED level 02 staff in settings.

*Explicit stratification:* Organised by funding with 2 categories (public, private) and region with 12 categories.

*Implicit stratification:* Not used.

*Data sources:* Data used for setting sampling were obtained from the Ministry of National Education and referred to school year 2022/23.

**Table A D.1. Setting participation status: survey of leaders – Türkiye, ISCED level 02**

| Explicit stratum                       | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Public – Istanbul Region               | 22                     | 1                   | 0                 | 21                             | 0                                | 0                                 | 0                          |
| Public – West Marmara Region           | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Public – Aegean Region                 | 22                     | 1                   | 0                 | 21                             | 0                                | 0                                 | 0                          |
| Public – East Marmara Region           | 18                     | 0                   | 0                 | 18                             | 0                                | 0                                 | 0                          |
| Public – West Anatolia Region          | 14                     | 0                   | 0                 | 14                             | 0                                | 0                                 | 0                          |
| Public – Mediterranean Region          | 26                     | 0                   | 0                 | 26                             | 0                                | 0                                 | 0                          |
| Public – Central Anatolia Region       | 10                     | 0                   | 0                 | 10                             | 0                                | 0                                 | 0                          |
| Public – West Black Sea Region         | 10                     | 0                   | 0                 | 10                             | 0                                | 0                                 | 0                          |
| Public – East Black Sea Region         | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Public – Northeast Anatolia Region     | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Public – Central East Anatolia Region  | 10                     | 0                   | 0                 | 10                             | 0                                | 0                                 | 0                          |
| Public – Southeast Anatolia Region     | 26                     | 0                   | 0                 | 26                             | 0                                | 0                                 | 0                          |
| Private – Istanbul Region              | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – West Marmara Region          | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| Private – Aegean Region                | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – East Marmara Region          | 8                      | 2                   | 0                 | 6                              | 0                                | 0                                 | 0                          |
| Private – West Anatolia Region         | 8                      | 0                   | 0                 | 7                              | 0                                | 0                                 | 1                          |
| Private – Mediterranean Region         | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| Private – Central Anatolia Region      | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – West Black Sea Region        | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – East Black Sea Region        | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – Northeast Anatolia Region    | 8                      | 1                   | 0                 | 6                              | 0                                | 0                                 | 1                          |
| Private – Central East Anatolia Region | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – Southeast Anatolia Region    | 8                      | 0                   | 0                 | 6                              | 0                                | 0                                 | 2                          |
| <b>Total</b>                           | <b>278</b>             | <b>7</b>            | <b>0</b>          | <b>267</b>                     | <b>0</b>                         | <b>0</b>                          | <b>4</b>                   |

Table A D.2. Setting participation status: survey of staff – Türkiye, ISCED level 02

| Explicit stratum                       | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Public – Istanbul Region               | 22                     | 1                   | 0                 | 21                             | 0                                | 0                                 | 0                          |
| Public – West Marmara Region           | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Public – Aegean Region                 | 22                     | 1                   | 0                 | 20                             | 0                                | 0                                 | 1                          |
| Public – East Marmara Region           | 18                     | 0                   | 0                 | 18                             | 0                                | 0                                 | 0                          |
| Public – West Anatolia Region          | 14                     | 0                   | 0                 | 12                             | 0                                | 0                                 | 2                          |
| Public – Mediterranean Region          | 26                     | 0                   | 0                 | 26                             | 0                                | 0                                 | 0                          |
| Public – Central Anatolia Region       | 10                     | 0                   | 0                 | 10                             | 0                                | 0                                 | 0                          |
| Public – West Black Sea Region         | 10                     | 0                   | 0                 | 10                             | 0                                | 0                                 | 0                          |
| Public – East Black Sea Region         | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Public – Northeast Anatolia Region     | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Public – Central East Anatolia Region  | 10                     | 0                   | 0                 | 10                             | 0                                | 0                                 | 0                          |
| Public – Southeast Anatolia Region     | 26                     | 0                   | 0                 | 26                             | 0                                | 0                                 | 0                          |
| Private – Istanbul Region              | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – West Marmara Region          | 8                      | 1                   | 0                 | 6                              | 0                                | 0                                 | 1                          |
| Private – Aegean Region                | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – East Marmara Region          | 8                      | 2                   | 0                 | 6                              | 0                                | 0                                 | 0                          |
| Private – West Anatolia Region         | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – Mediterranean Region         | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| Private – Central Anatolia Region      | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – West Black Sea Region        | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – East Black Sea Region        | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – Northeast Anatolia Region    | 8                      | 1                   | 0                 | 7                              | 0                                | 0                                 | 0                          |
| Private – Central East Anatolia Region | 8                      | 0                   | 0                 | 8                              | 0                                | 0                                 | 0                          |
| Private – Southeast Anatolia Region    | 8                      | 0                   | 0                 | 6                              | 0                                | 0                                 | 2                          |
| <b>Total</b>                           | <b>278</b>             | <b>7</b>            | <b>0</b>          | <b>265</b>                     | <b>0</b>                         | <b>0</b>                          | <b>6</b>                   |

Table A D.3. Staff participation status – Türkiye, ISCED level 02

| Participation status     | Staff        |
|--------------------------|--------------|
| Participated             | 1 289        |
| Absent                   | 21           |
| Left setting permanently | 12           |
| Not part of sample       | 23           |
| <b>Total</b>             | <b>1 345</b> |

## Characteristics of national samples, children under three years of age (U3)

### **Flemish Community (Belgium): U3**

**Sample allocation:** Disproportional allocation to allow comparisons between subsidy types, then adjusted to select a minimum of eight settings in the smaller strata.

**Sample sizes:** 47 settings were selected for the field trial; 270 settings were selected for the main survey.

**Method of sample selection:** Systematic random sampling with selection probabilities proportional to setting size.

**Measure of size:** Number of U3 places in settings.

**Explicit stratification:** Organised by setting type with two categories (centre-based, home-based) and subsidy type with four categories (basic subsidy + income-related fee + subsidy, basic subsidy + income-related fee, basic subsidy, no subsidy).

**Implicit stratification:** Not used.

**Data sources:** Data used for setting sampling were obtained from the agency Growing Up and referred to 2022.

**Weighting:** The strata “Centre-based settings – No subsidy” and “Home-based settings – No subsidy” were treated as excluded because very few settings participated.

**Table A D.1. Setting participation status: survey of leaders – Flemish Community (Belgium), U3**

| Explicit stratum                                                     | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Centre-based settings – Basic subsidy + income-related fee + subsidy | 22                     | 0                   | 0                 | 9                              | 3                                | 4                                 | 6                          |
| Centre-based settings – Basic subsidy + income-related fee           | 116                    | 0                   | 0                 | 46                             | 15                               | 6                                 | 49                         |
| Centre-based settings – Basic subsidy                                | 40                     | 0                   | 0                 | 5                              | 3                                | 1                                 | 31                         |
| Centre-based settings – No subsidy                                   | 22                     | 1                   | 21                | 0                              | 0                                | 0                                 | 0                          |
| Home-based settings – Basic subsidy + income-related fee + subsidy   | 8                      | 1                   | 0                 | 4                              | 0                                | 1                                 | 2                          |
| Home-based settings – Basic subsidy + income-related fee             | 46                     | 2                   | 0                 | 16                             | 6                                | 3                                 | 19                         |
| Home-based settings – Basic subsidy                                  | 8                      | 0                   | 0                 | 1                              | 1                                | 1                                 | 5                          |
| Home-based settings – No subsidy                                     | 8                      | 0                   | 8                 | 0                              | 0                                | 0                                 | 0                          |
| <b>Total</b>                                                         | <b>270</b>             | <b>4</b>            | <b>29</b>         | <b>81</b>                      | <b>28</b>                        | <b>16</b>                         | <b>112</b>                 |

**Table A D.2. Setting participation status: survey of staff – Flemish Community (Belgium), U3**

| Explicit stratum                                                     | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Centre-based settings – Basic subsidy + income-related fee + subsidy | 22                     | 0                   | 0                 | 10                             | 2                                | 4                                 | 6                          |
| Centre-based settings – Basic subsidy + income-related fee           | 116                    | 0                   | 0                 | 46                             | 15                               | 6                                 | 49                         |
| Centre-based settings – Basic subsidy                                | 40                     | 0                   | 0                 | 5                              | 4                                | 2                                 | 29                         |
| Centre-based settings – No subsidy                                   | 22                     | 1                   | 21                | 0                              | 0                                | 0                                 | 0                          |

| Explicit stratum                                                   | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|--------------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Home-based settings – Basic subsidy + income-related fee + subsidy | 8                      | 1                   | 0                 | 4                              | 0                                | 1                                 | 2                          |
| Home-based settings – Basic subsidy + income-related fee           | 46                     | 2                   | 0                 | 16                             | 7                                | 3                                 | 18                         |
| Home-based settings – Basic subsidy                                | 8                      | 0                   | 0                 | 1                              | 1                                | 1                                 | 5                          |
| Home-based settings – No subsidy                                   | 8                      | 0                   | 8                 | 0                              | 0                                | 0                                 | 0                          |
| <b>Total</b>                                                       | <b>270</b>             | <b>4</b>            | <b>29</b>         | <b>82</b>                      | <b>29</b>                        | <b>17</b>                         | <b>109</b>                 |

**Table A D.3. Staff participation status – Flemish Community (Belgium), U3**

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 499        |
| Absent                   | 108        |
| Left setting permanently | 18         |
| Not part of sample       | 13         |
| <b>Total</b>             | <b>638</b> |

### Germany: U3

**Sample allocation:** Proportional to the number of U3 settings, then adjusted to select a minimum of eight settings in the smaller strata.

**Sample sizes:** 62 settings were selected for the field trial; 270 settings were selected for the main survey.

**Method of sample selection:** Systematic random sampling with equal probabilities.

**Measure of size:** None.

**Explicit stratification:** Organised by overlap with two categories (U3 only, U3 and ISCED level 02), region with two categories (Eastern Germany, Western Germany) for U3 and ISCED level 02 settings and funding with three categories (public, private, missing information) for U3 and ISCED level 02 settings.

**Implicit stratification:** Organised by region with two categories (Eastern Germany, Western Germany), funding with three categories (public, private, missing information), state with 16 categories and provider with eight categories (public providers, the Workers' Welfare Association [AWO] or affiliated organisations, the German Red Cross or affiliated organisations, providers affiliated to the Protestant Church, providers affiliated to the Catholic Church, other private non-profit providers, private for-profit providers, missing information).

**Data sources:** Data used for setting sampling were obtained from the 16 German states and referred to 2022.

**Table A D.1. Setting participation status: survey of leaders – Germany, U3**

| Explicit stratum                                        | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| U3 only                                                 | 14                     | 1                   | 0                 | 7                              | 1                                | 3                                 | 2                          |
| U3 and ISCED 02 – Eastern Germany – Public              | 12                     | 0                   | 0                 | 6                              | 1                                | 0                                 | 5                          |
| U3 and ISCED 02 – Eastern Germany – Private             | 26                     | 3                   | 0                 | 11                             | 4                                | 1                                 | 7                          |
| U3 and ISCED 02 – Eastern Germany – Missing information | 12                     | 0                   | 0                 | 7                              | 1                                | 2                                 | 2                          |
| U3 and ISCED 02 – Western Germany – Public              | 64                     | 16                  | 0                 | 26                             | 4                                | 7                                 | 11                         |
| U3 and ISCED 02 – Western Germany – Private             | 134                    | 25                  | 0                 | 51                             | 17                               | 13                                | 28                         |
| U3 and ISCED 02 – Western Germany – Missing information | 8                      | 2                   | 0                 | 2                              | 1                                | 0                                 | 3                          |
| <b>Total</b>                                            | <b>270</b>             | <b>47</b>           | <b>0</b>          | <b>110</b>                     | <b>29</b>                        | <b>26</b>                         | <b>58</b>                  |

**Table A D.2. Setting participation status: survey of staff – Germany, U3**

| Explicit stratum                            | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| U3 only                                     | 14                     | 1                   | 0                 | 7                              | 1                                | 3                                 | 2                          |
| U3 and ISCED 02 – Eastern Germany – Public  | 12                     | 0                   | 0                 | 5                              | 1                                | 0                                 | 6                          |
| U3 and ISCED 02 – Eastern Germany – Private | 26                     | 3                   | 0                 | 12                             | 4                                | 1                                 | 6                          |



| Explicit stratum                                        | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| U3 and ISCED 02 – Eastern Germany – Missing information | 12                     | 0                   | 0                 | 7                              | 1                                | 2                                 | 2                          |
| U3 and ISCED 02 – Western Germany – Public              | 64                     | 16                  | 0                 | 27                             | 4                                | 7                                 | 10                         |
| U3 and ISCED 02 – Western Germany – Private             | 134                    | 25                  | 0                 | 53                             | 17                               | 13                                | 26                         |
| U3 and ISCED 02 – Western Germany – Missing information | 8                      | 2                   | 0                 | 1                              | 1                                | 0                                 | 4                          |
| <b>Total</b>                                            | <b>270</b>             | <b>47</b>           | <b>0</b>          | <b>112</b>                     | <b>29</b>                        | <b>26</b>                         | <b>56</b>                  |

**Table A D.3. Staff participation status – Germany, U3**

| Participation status     | Staff        |
|--------------------------|--------------|
| Participated             | 876          |
| Absent                   | 113          |
| Left setting permanently | 14           |
| Not part of sample       | 5            |
| <b>Total</b>             | <b>1 008</b> |

### Ireland: U3

*Sample allocation:* Proportional to the number of places.

*Sample sizes:* 40 settings were selected for the field trial; 250 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of places in settings.

*Explicit stratification:* Organised by deprivation with three categories (disadvantaged, average, affluent). Additional strata with self-representing replacements were created after the survey administration; these replacements would have replaced other participating settings.

*Implicit stratification:* Organised by region with three categories (Eastern and Midland Region, Northern and Western Region, Southern Region) and urbanisation with two categories (urban, rural).

*Data sources:* Data used for setting sampling were obtained from the Child and Family Agency and referred to 2023.

**Table A D.1. Setting participation status: survey of leaders – Ireland, U3**

| Explicit stratum                  | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-----------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Disadvantaged                     | 34                     | 1                   | 0                 | 16                             | 5                                | 0                                 | 12                         |
| Average                           | 166                    | 3                   | 0                 | 67                             | 25                               | 8                                 | 63                         |
| Affluent                          | 50                     | 3                   | 0                 | 14                             | 6                                | 2                                 | 25                         |
| Disadvantaged – Self-representing | 9                      | 0                   | 0                 | 0                              | 5                                | 3                                 | 1                          |
| Average – Self-representing       | 34                     | 0                   | 0                 | 0                              | 13                               | 16                                | 5                          |
| Affluent – Self-representing      | 3                      | 0                   | 0                 | 0                              | 1                                | 2                                 | 0                          |
| <b>Total</b>                      | <b>296</b>             | <b>7</b>            | <b>0</b>          | <b>97</b>                      | <b>55</b>                        | <b>31</b>                         | <b>106</b>                 |

**Table A D.2. Setting participation status: survey of staff – Ireland, U3**

| Explicit stratum                  | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-----------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Disadvantaged                     | 34                     | 1                   | 0                 | 17                             | 5                                | 1                                 | 10                         |
| Average                           | 166                    | 3                   | 0                 | 72                             | 28                               | 10                                | 53                         |
| Affluent                          | 50                     | 3                   | 0                 | 18                             | 7                                | 3                                 | 19                         |
| Disadvantaged – Self-representing | 9                      | 0                   | 0                 | 0                              | 5                                | 4                                 | 0                          |
| Average – Self-representing       | 34                     | 0                   | 0                 | 0                              | 13                               | 21                                | 0                          |
| Affluent – Self-representing      | 3                      | 0                   | 0                 | 0                              | 1                                | 2                                 | 0                          |
| <b>Total</b>                      | <b>296</b>             | <b>7</b>            | <b>0</b>          | <b>107</b>                     | <b>59</b>                        | <b>41</b>                         | <b>82</b>                  |

**Table A D.3. Staff participation status – Ireland, U3**

| Participation status     | Staff        |
|--------------------------|--------------|
| Participated             | 899          |
| Absent                   | 284          |
| Left setting permanently | 27           |
| Not part of sample       | 0            |
| <b>Total</b>             | <b>1 210</b> |

**Israel: U3**

*Sample allocation:* Disproportional allocation to oversample specific orientations.

*Sample sizes:* 60 settings were selected for the field trial; 362 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of U3 children in centre-based settings; number of U3 staff in home-based settings.

*Explicit stratification:* Organised by setting type with two categories (centre-based, home-based), orientation with four categories (Hebrew-speaking, Arabic-speaking, ultra-Orthodox, mixed) and subsidy with two categories (subsidised, not subsidised) for centre-based settings.

*Implicit stratification:* Organised by socio-economic status with three categories (low, medium, high) and districts with six categories (Haifa, Jerusalem, Tel Aviv, districts other than Jerusalem, districts other than Haifa, districts other than Tel Aviv) for home-based settings Hebrew-speaking high socio-economic status, home-based settings Arabic-speaking, home-based settings ultra-Orthodox high socio-economic status and home-based settings mixed high socio-economic status.

*Data sources:* Data used for setting sampling were obtained from the Ministry of Education and the Ministry of Labor and referred to school year 2023/24.

**Table A D.1. Setting participation status: survey of leaders – Israel, U3**

| Explicit stratum                                | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Centre-based – Hebrew speaking – Subsidised     | 68                     | 2                   | 1                 | 51                             | 6                                | 3                                 | 5                          |
| Centre-based – Hebrew speaking – Not subsidised | 82                     | 2                   | 2                 | 62                             | 4                                | 1                                 | 11                         |
| Centre-based – Arabic speaking – Subsidised     | 36                     | 0                   | 0                 | 33                             | 1                                | 0                                 | 2                          |
| Centre-based – Arabic speaking – Not subsidised | 34                     | 2                   | 0                 | 25                             | 4                                | 1                                 | 2                          |
| Centre-based – Ultra-Orthodox – Subsidised      | 32                     | 0                   | 0                 | 20                             | 2                                | 0                                 | 10                         |
| Centre-based – Ultra-Orthodox – Not subsidised  | 8                      | 0                   | 0                 | 4                              | 1                                | 0                                 | 3                          |
| Home-based – Hebrew speaking                    | 20                     | 7                   | 0                 | 12                             | 0                                | 0                                 | 1                          |
| Home-based – Arabic speaking                    | 40                     | 2                   | 0                 | 28                             | 2                                | 3                                 | 5                          |
| Home-based – Ultra-Orthodox                     | 26                     | 4                   | 0                 | 15                             | 0                                | 0                                 | 7                          |
| Home-based – Mixed                              | 16                     | 2                   | 0                 | 11                             | 0                                | 0                                 | 3                          |
| <b>Total</b>                                    | <b>362</b>             | <b>21</b>           | <b>3</b>          | <b>261</b>                     | <b>20</b>                        | <b>8</b>                          | <b>49</b>                  |

Table A D.2. Setting participation status: survey of staff – Israel, U3

| Explicit stratum                                | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Centre-based – Hebrew speaking – Subsidised     | 68                     | 2                   | 1                 | 51                             | 6                                | 3                                 | 5                          |
| Centre-based – Hebrew speaking – Not subsidised | 82                     | 2                   | 2                 | 63                             | 5                                | 1                                 | 9                          |
| Centre-based – Arabic speaking – Subsidised     | 36                     | 0                   | 0                 | 33                             | 1                                | 0                                 | 2                          |
| Centre-based – Arabic speaking – Not subsidised | 34                     | 2                   | 0                 | 26                             | 5                                | 1                                 | 0                          |
| Centre-based – Ultra-Orthodox – Subsidised      | 32                     | 0                   | 0                 | 22                             | 3                                | 0                                 | 7                          |
| Centre-based – Ultra-Orthodox – Not subsidised  | 8                      | 0                   | 0                 | 5                              | 1                                | 0                                 | 2                          |
| Home-based – Hebrew speaking                    | 20                     | 7                   | 0                 | 12                             | 0                                | 0                                 | 1                          |
| Home-based – Arabic speaking                    | 40                     | 2                   | 0                 | 28                             | 2                                | 3                                 | 5                          |
| Home-based – Ultra-Orthodox                     | 26                     | 4                   | 0                 | 15                             | 0                                | 0                                 | 7                          |
| Home-based – Mixed                              | 16                     | 2                   | 0                 | 11                             | 0                                | 0                                 | 3                          |
| <b>Total</b>                                    | <b>362</b>             | <b>21</b>           | <b>3</b>          | <b>266</b>                     | <b>23</b>                        | <b>8</b>                          | <b>41</b>                  |

Table A D.3. Staff participation status – Israel, U3

| Participation status     | Staff        |
|--------------------------|--------------|
| Participated             | 1 505        |
| Absent                   | 257          |
| Left setting permanently | 20           |
| Not part of sample       | 7            |
| <b>Total</b>             | <b>1 789</b> |

### New Brunswick (Canada): U3

*Sample allocation:* Disproportional allocation to increase the number of home-based settings.

*Sample sizes:* 33 settings were selected for the field trial; 254 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of children in U3 settings.

*Explicit stratification:* Organised by setting type with two categories (centre-based, home-based) and language with two categories (anglophone, francophone).

*Implicit stratification:* Not used.

*Data sources:* Data used for setting sampling were obtained from the New Brunswick Department of Education and Early Childhood Development and referred to 2022.

**Table A D.1. Setting participation status: survey of leaders – New Brunswick (Canada), U3**

| Explicit stratum           | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Home-based – Anglophone    | 50                     | 9                   | 0                 | 14                             | 0                                | 0                                 | 27                         |
| Home-based – Francophone   | 40                     | 2                   | 0                 | 15                             | 3                                | 0                                 | 20                         |
| Centre-based – Anglophone  | 104                    | 5                   | 0                 | 18                             | 2                                | 0                                 | 79                         |
| Centre-based – Francophone | 60                     | 3                   | 0                 | 28                             | 2                                | 2                                 | 25                         |
| <b>Total</b>               | <b>254</b>             | <b>19</b>           | <b>0</b>          | <b>75</b>                      | <b>7</b>                         | <b>2</b>                          | <b>151</b>                 |

**Table A D.2. Setting participation status: survey of staff – New Brunswick (Canada), U3**

| Explicit stratum           | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Home-based – Anglophone    | 50                     | 9                   | 0                 | 14                             | 0                                | 0                                 | 27                         |
| Home-based – Francophone   | 40                     | 2                   | 0                 | 15                             | 3                                | 0                                 | 20                         |
| Centre-based – Anglophone  | 104                    | 5                   | 0                 | 20                             | 2                                | 0                                 | 77                         |
| Centre-based – Francophone | 60                     | 3                   | 0                 | 30                             | 2                                | 2                                 | 23                         |
| <b>Total</b>               | <b>254</b>             | <b>19</b>           | <b>0</b>          | <b>79</b>                      | <b>7</b>                         | <b>2</b>                          | <b>147</b>                 |

**Table A D.3. Staff participation status – New Brunswick (Canada), U3**

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 275        |
| Absent                   | 42         |
| Left setting permanently | 19         |
| Not part of sample       | 10         |
| <b>Total</b>             | <b>346</b> |

### New Zealand: U3

The target population comprises New Zealand, not including the associated states Cook Islands and Niue or the dependent territory Tokelau.

*Sample allocation:* Disproportional allocation to increase the number of home-based settings.

*Sample sizes:* 55 settings were selected for the field trial; 214 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of staff in U3 settings.

*Explicit stratification:* Organised by overlap with two categories (U3 only, U3 and ISCED level 02) and setting type with five categories (education and care service, free kindergarten, home-based network, playcentre, Te Kōhanga Reo [Māori language immersion environment for children and families]).

*Implicit stratification:* Organised by region with four categories (central northern, central southern, northern, southern).

*Data sources:* Data used for setting sampling were obtained from the Ministry of Education and referred to 2022.

*Weighting:* Due to very low participation rates, it was decided to calculate weights without non-response adjustments. The resulting outcomes represent the part of the population that would have participated in TALIS, given they were sampled. The strata “U3 and ISCED level 02 – Free kindergarten”, “U3 and ISCED level 02 – Playcentre” and “U3 and ISCED level 02 – Te Kōhanga Reo [Māori language immersion environment for children and families]” were treated as excluded because no setting participated.

**Table A D.1. Setting participation status: survey of leaders – New Zealand, U3**

| Explicit stratum                                                                                  | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| U3 only – Education and care services                                                             | 8                      | 0                   | 0                 | 4                              | 0                                | 0                                 | 4                          |
| U3 only – Home-based network                                                                      | 38                     | 8                   | 0                 | 3                              | 0                                | 0                                 | 27                         |
| U3 and ISCED 02 – Education and care service                                                      | 110                    | 5                   | 0                 | 21                             | 5                                | 1                                 | 78                         |
| U3 and ISCED 02 – Free kindergarten                                                               | 8                      | 0                   | 8                 | 0                              | 0                                | 0                                 | 0                          |
| U3 and ISCED 02 – Playcentre                                                                      | 26                     | 1                   | 25                | 0                              | 0                                | 0                                 | 0                          |
| U3 and ISCED 02 – Te Kōhanga Reo (Māori language immersion environment for children and families) | 24                     | 0                   | 24                | 0                              | 0                                | 0                                 | 0                          |
| <b>Total</b>                                                                                      | <b>214</b>             | <b>14</b>           | <b>57</b>         | <b>28</b>                      | <b>5</b>                         | <b>1</b>                          | <b>109</b>                 |

**Table A D.2. Setting participation status: survey of staff – New Zealand, U3**

| Explicit stratum                             | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| U3 only – Education and care services        | 8                      | 0                   | 0                 | 4                              | 0                                | 0                                 | 4                          |
| U3 only – Home-based network                 | 38                     | 8                   | 0                 | 3                              | 0                                | 0                                 | 27                         |
| U3 and ISCED 02 – Education and care service | 110                    | 5                   | 0                 | 19                             | 6                                | 1                                 | 79                         |
| U3 and ISCED 02 – Free kindergarten          | 8                      | 0                   | 8                 | 0                              | 0                                | 0                                 | 0                          |

| Explicit stratum                                                                                  | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|---------------------------------------------------------------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| U3 and ISCED 02 – Playcentre                                                                      | 26                     | 1                   | 25                | 0                              | 0                                | 0                                 | 0                          |
| U3 and ISCED 02 – Te Kōhanga Reo (Māori language immersion environment for children and families) | 24                     | 0                   | 24                | 0                              | 0                                | 0                                 | 0                          |
| <b>Total</b>                                                                                      | <b>214</b>             | <b>14</b>           | <b>57</b>         | <b>26</b>                      | <b>6</b>                         | <b>1</b>                          | <b>110</b>                 |

**Table A D.3. Staff participation status – New Zealand, U3**

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 164        |
| Absent                   | 56         |
| Left setting permanently | 1          |
| Not part of sample       | 0          |
| <b>Total</b>             | <b>221</b> |

### Norway: U3

*Sample allocation:* Proportional to the number of staff, then adjusted to select a minimum of eight settings in the smaller strata.

*Sample sizes:* 32 settings were selected for the field trial; 190 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of staff in U3 settings.

*Explicit stratification:* Organised by funding with two categories (public, private) and number of inhabitants with three categories (fewer than 5 000 inhabitants, 5 000 to 19 999 inhabitants, 20 000 or more inhabitants).

*Implicit stratification:* Organised by region with four categories (Central and Northern Norway, Eastern Norway, Greater Oslo Region, Southern and Western Norway).

*Data sources:* Data used for setting sampling were obtained from the Norwegian Directorate for Education and Training and referred to 2021.

**Table A D.1. Setting participation status: survey of leaders – Norway, U3**

| Explicit stratum                       | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Public – Fewer than 5 000 inhabitants  | 12                     | 1                   | 0                 | 1                              | 1                                | 0                                 | 9                          |
| Public – 5 000 to 19 999 inhabitants   | 24                     | 0                   | 0                 | 9                              | 6                                | 0                                 | 9                          |
| Public – 20 000 or more inhabitants    | 60                     | 1                   | 0                 | 18                             | 4                                | 1                                 | 36                         |
| Private – Fewer than 5 000 inhabitants | 8                      | 0                   | 0                 | 3                              | 1                                | 0                                 | 4                          |
| Private – 5 000 to 19 999 inhabitants  | 18                     | 0                   | 0                 | 6                              | 0                                | 2                                 | 10                         |
| Private – 20 000 or more inhabitants   | 68                     | 2                   | 0                 | 15                             | 6                                | 3                                 | 42                         |
| <b>Total</b>                           | <b>190</b>             | <b>4</b>            | <b>0</b>          | <b>52</b>                      | <b>18</b>                        | <b>6</b>                          | <b>110</b>                 |

**Table A D.2. Setting participation status: survey of staff – Norway, U3**

| Explicit stratum                       | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|----------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Public – Fewer than 5 000 inhabitants  | 12                     | 1                   | 0                 | 1                              | 1                                | 0                                 | 9                          |
| Public – 5 000 to 19 999 inhabitants   | 24                     | 0                   | 0                 | 9                              | 5                                | 0                                 | 10                         |
| Public – 20 000 or more inhabitants    | 60                     | 1                   | 0                 | 16                             | 3                                | 1                                 | 39                         |
| Private – Fewer than 5 000 inhabitants | 8                      | 0                   | 0                 | 2                              | 1                                | 0                                 | 5                          |
| Private – 5 000 to 19 999 inhabitants  | 18                     | 0                   | 0                 | 5                              | 0                                | 2                                 | 11                         |
| Private – 20 000 or more inhabitants   | 68                     | 2                   | 0                 | 14                             | 6                                | 2                                 | 44                         |
| <b>Total</b>                           | <b>190</b>             | <b>4</b>            | <b>0</b>          | <b>47</b>                      | <b>16</b>                        | <b>5</b>                          | <b>118</b>                 |

**Table A D.3. Staff participation status – Norway, U3**

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 367        |
| Absent                   | 144        |
| Left setting permanently | 0          |
| Not part of sample       | 3          |
| <b>Total</b>             | <b>514</b> |



### Quebec (Canada): U3

*Sample allocation:* Proportional to the number of children in U3 settings.

*Sample sizes:* 35 settings were selected for the field trial; 188 settings were selected for the main survey.

*Method of sample selection:* Systematic random sampling with selection probabilities proportional to setting size.

*Measure of size:* Number of children in U3 settings.

*Explicit stratification:* Organised by setting type with two categories (centre-based, home-based) and detailed setting type with four categories (childcare centre, subsidised day care centre, non-subsidised day care centre, home childcare service).

*Implicit stratification:* Not used.

*Data sources:* Data used for setting sampling were obtained from the Ministry of Families and referred to 2022.

**Table A D.1. Setting participation status: survey of leaders – Quebec (Canada), U3**

| Explicit stratum                              | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-----------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Centre-based – Childcare centre               | 66                     | 0                   | 0                 | 18                             | 10                               | 10                                | 28                         |
| Centre-based – Subsidised day care centre     | 34                     | 1                   | 0                 | 6                              | 4                                | 2                                 | 21                         |
| Centre-based – Non-subsidised day care centre | 44                     | 0                   | 0                 | 7                              | 3                                | 5                                 | 29                         |
| Home-based – Home childcare service           | 44                     | 14                  | 0                 | 7                              | 7                                | 6                                 | 10                         |
| <b>Total</b>                                  | <b>188</b>             | <b>15</b>           | <b>0</b>          | <b>38</b>                      | <b>24</b>                        | <b>23</b>                         | <b>88</b>                  |

**Table A D.2. Setting participation status: survey of staff – Quebec (Canada), U3**

| Explicit stratum                              | Total sampled settings | Ineligible settings | Excluded settings | Participating sampled settings | Participating first replacements | Participating second replacements | Non-participating settings |
|-----------------------------------------------|------------------------|---------------------|-------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------|
| Centre-based – Childcare centre               | 66                     | 0                   | 0                 | 16                             | 11                               | 8                                 | 31                         |
| Centre-based – Subsidised day care centre     | 34                     | 1                   | 0                 | 6                              | 6                                | 1                                 | 20                         |
| Centre-based – Non-subsidised day care centre | 44                     | 0                   | 0                 | 7                              | 3                                | 4                                 | 30                         |
| Home-based – Home childcare service           | 44                     | 14                  | 0                 | 7                              | 7                                | 6                                 | 10                         |
| <b>Total</b>                                  | <b>188</b>             | <b>15</b>           | <b>0</b>          | <b>36</b>                      | <b>27</b>                        | <b>19</b>                         | <b>91</b>                  |

**Table A D.3. Staff participation status – Quebec (Canada), U3**

| Participation status     | Staff      |
|--------------------------|------------|
| Participated             | 311        |
| Absent                   | 144        |
| Left setting permanently | 14         |
| Not part of sample       | 7          |
| <b>Total</b>             | <b>476</b> |

## References

- UNESCO Institute of Statistics (2017), *International Standard Classification of Education (ISCED) Data Mapping*, <https://isced.uis.unesco.org/data-mapping/>. [1]

## Annex E. Listing and tracking forms

This annex presents the listing and tracking forms that were used during the OECD Teaching and Learning International Survey (TALIS) survey administration. In the listing forms, school/setting co-ordinators were asked to list all eligible teachers/staff of their school/setting. The tracking forms indicated which teachers/staff were sampled, and they were used to indicate which teachers/staff participated in the survey.

### International Standard Classification of Education (ISCED) levels 1, 2 and 3

### Figure A E.1. Listing form for ISCED levels 1, 2 and 3

[illegible]

- ③ **Exemption:** 1 = This teacher also took part in the 2023 Field Trial
- ④ **Year of Birth:** YYYY
- ⑤ **Gender:** 1 = Female; 2 = Male; 3 = Non-binary/diverse; 9 = Refused
- ⑥ **Main Subject Domain when teaching classes at [ISCED Level x]:**  
1 = Language (mother tongue, foreign language); 2 = Human Sciences (History, Geography, Civics, Economics...);  
3 = Mathematics & Science (Physics, Chemistry, Geology, Biology...); 4 = Other (Music, Art, Ethics/Religion, Physical Education,  
Home Economics...); 9 = Not specified

Figure A E.2. Tracking form for ISCED levels 1, 2 and 3

| TALIS 2024 MS        |            | [ISCED LEVEL x] Teacher Tracking Form |               |        |                                                 |                       |                            |                                     |
|----------------------|------------|---------------------------------------|---------------|--------|-------------------------------------------------|-----------------------|----------------------------|-------------------------------------|
| TALIS Country/Region |            |                                       |               |        |                                                 |                       |                            |                                     |
| School Name          |            |                                       |               |        |                                                 |                       |                            |                                     |
| School ID            |            |                                       |               |        |                                                 |                       |                            |                                     |
| School Coordinator   |            |                                       |               |        |                                                 |                       |                            |                                     |
| ①                    | ②          | ③                                     | ④             | ⑤      | ⑥                                               | ⑦                     | ⑧                          |                                     |
| Teacher Name         | Teacher ID | Teacher ID                            | Year Of Birth | Gender | Main Subject Domain for [ISCED Level x] classes | Teacher Questionnaire | Teacher Questionnaire Mode | Teacher Questionnaire Return Status |
|                      |            |                                       |               |        |                                                 |                       |                            |                                     |
|                      |            |                                       |               |        |                                                 |                       |                            |                                     |
|                      |            |                                       |               |        |                                                 |                       |                            |                                     |
|                      |            |                                       |               |        |                                                 |                       |                            |                                     |
|                      |            |                                       |               |        |                                                 |                       |                            |                                     |
|                      |            |                                       |               |        |                                                 |                       |                            |                                     |
|                      |            |                                       |               |        |                                                 |                       |                            |                                     |

③ Year of Birth: YYYY; 9999 = Not specified

④ Gender:

1 = Female; 2 = Male; 3 = Non-binary/diverse; 9 = Refused

⑤ Main Subject Domain when teaching [ISCED Level x] classes:

1 = Language (mother tongue, foreign language) ; 2 = Human Sciences (History, Geography, Civics, Economics...);

3 = Mathematics & Science (Physics, Chemistry, Geology, Biology...); 4 = Other (Music, Art, Ethics/Religion, Physical Education, Home Economics...); 9 = Not specified

⑥ Teacher questionnaire:

FOR CORE SURVEY => A = Form A; B = Form B; C = Form C;

FOR TKS => 1 = Form 1; 2 = Form 2; 3 = Form 3; 4 = Form 4

⑦ Teacher Questionnaire Mode:

1 = Online; 2 = Paper

⑧ Teacher Questionnaire Return Status:

1 = Returned (online); 2 = Returned (paper); 3 = Not returned; 4 = Left school permanently; 5 = Teacher should have been out-of-scope; 9 = Unknown

### ISCED level 02 and children under the age of three (U3)

**Figure A E.3. Listing form for ISCED level 02 and U3**

[illegible]

- ③ **Exemption:** 1 = This person also took part in the 2023 Field Trial  
 ④ **Leader Role:** 1 = Leader of this ECEC setting  
 ⑤ **Staff Role:** 1 = <Only leader (no pedagogical work)>; 2 = <Teacher>; 3 = <Assistant>; 4 = <Staff for individual children>;  
 5 = <Staff for special tasks>; 6 = <Intern>; 7 = <country-specific>; 8 = <country-specific>; 9 = <country-specific>;  
 10 = <country-specific>; 11 = <country-specific>; 12 = <country-specific>  
 ⑥ **Year of Birth:** YYYY; 9999 = Not specified  
 ⑦ **Gender:** 1 = Female; 2 = Male; 3 = Non-binary/diverse; 9 = Refused

Figure A E.4. Tracking form for ISCED level 02 and U3

| TALIS Starting Strong 2024 MS - [level] Tracking Form |    |    |               |        |            |               |                    |                             |
|-------------------------------------------------------|----|----|---------------|--------|------------|---------------|--------------------|-----------------------------|
| Country/Region                                        |    |    |               |        |            |               |                    |                             |
| ECEC Setting Name                                     |    |    |               |        |            |               |                    |                             |
| ECEC Setting ID                                       |    |    |               |        |            |               |                    |                             |
| 1                                                     | 2  | 2  | 3             | 4      | 5          | 6             | 7                  | 8                           |
| Name                                                  | ID | ID | Year Of Birth | Gender | Staff Role | Questionnaire | Questionnaire Mode | Questionnaire Return Status |
|                                                       |    |    |               |        |            |               |                    |                             |
|                                                       |    |    |               |        |            |               |                    |                             |
|                                                       |    |    |               |        |            |               |                    |                             |
|                                                       |    |    |               |        |            |               |                    |                             |
|                                                       |    |    |               |        |            |               |                    |                             |
|                                                       |    |    |               |        |            |               |                    |                             |
|                                                       |    |    |               |        |            |               |                    |                             |
|                                                       |    |    |               |        |            |               |                    |                             |
|                                                       |    |    |               |        |            |               |                    |                             |
|                                                       |    |    |               |        |            |               |                    |                             |

③ Year of Birth: YYYY; 9999 = Not specified  
 ④ Gender:  
 1 = Female; 2 = Male; 3 = Non-binary/diverse; 9 = Refused  
 ⑤ Staff categories:  
 1 = <Only leader (no pedagogical work)>; 2 = <Teacher>; 3 = <Assistant>; 4 = <Staff for individual children>; 5 = <Staff for special tasks>; 6 = <Intern>;  
 7 = <country-specific>; 8 = <country-specific>; 9 = <country-specific>; 10 = <country-specific>; 11 = <country-specific>; 12 = <country-specific>  
 ⑥ Questionnaire:  
 10 = Leader Questionnaire; 21 = Staff Questionnaire; 30 = Combined Questionnaire -Main; 31 = Combined Questionnaire -Short  
 ⑦ Questionnaire Mode:  
 1 = Online; 2 = Paper  
 ⑧ Questionnaire Return Status:  
 1 = Returned (online); 2 = Returned (paper); 3 = Not returned; 4 = Left ECEC setting permanently; 5 = Person should have been out-of-scope; 9 = Unknown

## Annex F. Unweighted and weighted participation rates

This annex presents participation rates for every module, population and country/territory. Both unweighted and weighted participation rates and participation rates before and after the use of replacements are given. For the teacher/staff population, the school/setting level and the teacher/staff level within participating schools/settings are distinguished; the overall participation rate is the multiplication of both levels.

### Participation rates for International Standard Classification of Education (ISCED) level 2

**Table A F.1. Participation rates (%) for ISCED level 2 schools and principals**

| Participating country/territory | Unweighted         |                   | Weighted           |                   |
|---------------------------------|--------------------|-------------------|--------------------|-------------------|
|                                 | Before replacement | After replacement | Before replacement | After replacement |
| Albania                         | 99.6               | 100.0             | 99.6               | 100.0             |
| Alberta (Canada)                | 43.0               | 49.8              | 38.5               | 50.3              |
| Australia                       | 65.2               | 88.7              | 63.0               | 89.9              |
| Austria                         | 83.6               | 96.7              | 79.6               | 96.2              |
| Azerbaijan                      | 99.1               | 99.6              | 99.7               | 100.0             |
| Bahrain                         | 99.1               | 99.1              | 99.1               | 99.1              |
| Belgium                         | 65.0               | 73.4              | 63.1               | 72.4              |
| Flemish Community (Belgium)     | 57.1               | 66.2              | 56.0               | 66.1              |
| French Community (Belgium)      | 76.2               | 83.7              | 76.0               | 83.8              |
| Brazil                          | 87.0               | 91.8              | 89.9               | 94.3              |
| Bulgaria                        | 97.2               | 98.6              | 97.7               | 98.7              |
| Chile                           | 61.1               | 78.2              | 70.0               | 84.3              |
| Colombia                        | 63.8               | 68.5              | 62.2               | 68.3              |
| Costa Rica                      | 85.7               | 87.1              | 85.8               | 86.7              |
| Croatia                         | 87.5               | 87.5              | 87.8               | 87.8              |
| Cyprus                          | 99.0               | 99.0              | 99.0               | 99.0              |
| Czechia                         | 99.7               | 100.0             | 99.8               | 100.0             |
| Denmark                         | 54.9               | 79.7              | 54.9               | 80.9              |
| Estonia                         | 94.1               | 94.1              | 93.9               | 93.9              |
| Finland                         | 99.6               | 100.0             | 99.7               | 100.0             |
| France                          | 85.3               | 86.8              | 86.0               | 87.0              |
| Hungary                         | 93.5               | 93.9              | 93.3               | 93.8              |



| Participating country/territory | Unweighted         |                   | Weighted           |                   |
|---------------------------------|--------------------|-------------------|--------------------|-------------------|
|                                 | Before replacement | After replacement | Before replacement | After replacement |
| Iceland                         | 77.9               | 77.9              | 77.9               | 77.9              |
| Israel                          | 92.5               | 93.0              | 90.3               | 91.6              |
| Italy                           | 97.5               | 98.0              | 97.7               | 98.0              |
| Japan                           | 89.7               | 98.0              | 89.5               | 98.1              |
| Kazakhstan                      | 98.1               | 98.1              | 99.1               | 99.1              |
| Korea                           | 65.3               | 85.6              | 62.2               | 83.4              |
| Kosovo                          | 99.1               | 99.1              | 99.1               | 99.1              |
| Latvia                          | 96.3               | 97.7              | 96.3               | 97.9              |
| Lithuania                       | 99.5               | 100.0             | 98.7               | 100.0             |
| Malta                           | 90.9               | 90.9              | 90.9               | 90.9              |
| Montenegro                      | 80.7               | 80.7              | 80.7               | 80.7              |
| Morocco                         | 99.7               | 100.0             | 98.5               | 100.0             |
| Netherlands                     | 35.6               | 52.3              | 33.7               | 51.9              |
| New Zealand                     | 25.8               | 39.3              | 27.2               | 51.4              |
| North Macedonia                 | 99.5               | 99.5              | 99.6               | 99.6              |
| Norway                          | 44.6               | 69.7              | 41.8               | 66.7              |
| Poland                          | 93.6               | 99.6              | 93.4               | 99.6              |
| Portugal                        | 98.7               | 99.1              | 98.8               | 99.3              |
| Romania                         | 100.0              | 100.0             | 100.0              | 100.0             |
| Saudi Arabia                    | 95.5               | 95.5              | 95.6               | 95.6              |
| Serbia                          | 98.5               | 99.5              | 98.3               | 99.4              |
| Shanghai (China)                | 100.0              | 100.0             | 100.0              | 100.0             |
| Singapore                       | 95.6               | 96.9              | 86.9               | 92.8              |
| Slovak Republic                 | 95.9               | 98.8              | 95.7               | 99.0              |
| Slovenia                        | 77.3               | 78.4              | 77.4               | 79.1              |
| South Africa                    | 81.4               | 82.0              | 84.4               | 84.6              |
| Spain                           | 97.2               | 97.4              | 97.7               | 97.9              |
| Sweden                          | 86.4               | 88.8              | 85.1               | 88.2              |
| Türkiye                         | 98.3               | 98.3              | 98.5               | 98.5              |
| United Arab Emirates            | 98.6               | 98.6              | 98.8               | 98.8              |
| United States                   | 48.0               | 59.4              | 44.9               | 54.3              |
| Uzbekistan                      | 100.0              | 100.0             | 100.0              | 100.0             |
| Viet Nam                        | 100.0              | 100.0             | 100.0              | 100.0             |

Table A F.2. Participation rates (%) for ISCED level 2 teachers

| Participating country/territory | Unweighted                 |                           |                                   |                               | Weighted                   |                           |                                   |                               |
|---------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|
|                                 | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation |
| Albania                         | 99.6                       | 100.0                     | 99.4                              | 99.4                          | 99.8                       | 100.0                     | 99.4                              | 99.4                          |
| Alberta (Canada)                | 47.7                       | 54.8                      | 81.5                              | 44.7                          | 46.4                       | 56.4                      | 82.2                              | 46.4                          |
| Australia                       | 65.2                       | 87.7                      | 87.0                              | 76.3                          | 66.6                       | 88.5                      | 86.7                              | 76.7                          |
| Austria                         | 77.5                       | 89.8                      | 85.9                              | 77.2                          | 77.0                       | 89.9                      | 84.8                              | 76.2                          |
| Azerbaijan                      | 99.1                       | 99.6                      | 98.5                              | 98.0                          | 99.5                       | 100.0                     | 98.4                              | 98.4                          |
| Bahrain                         | 100.0                      | 100.0                     | 97.7                              | 97.7                          | 100.0                      | 100.0                     | 97.3                              | 97.3                          |
| Belgium                         | 67.5                       | 76.5                      | 84.5                              | 64.6                          | 67.2                       | 76.1                      | 84.3                              | 64.2                          |
| Flemish Community (Belgium)     | 58.1                       | 68.1                      | 84.2                              | 57.4                          | 58.1                       | 68.3                      | 84.2                              | 57.5                          |
| French Community (Belgium)      | 81.0                       | 88.4                      | 84.7                              | 74.9                          | 81.1                       | 88.2                      | 84.3                              | 74.4                          |
| Brazil                          | 85.7                       | 89.6                      | 95.5                              | 85.5                          | 89.9                       | 92.4                      | 95.2                              | 87.9                          |
| Bulgaria                        | 98.1                       | 99.5                      | 99.2                              | 98.7                          | 97.9                       | 99.6                      | 99.1                              | 98.7                          |
| Chile                           | 59.8                       | 76.2                      | 81.7                              | 62.3                          | 66.2                       | 79.8                      | 84.0                              | 67.0                          |
| Colombia                        | 71.7                       | 77.2                      | 91.9                              | 70.9                          | 72.2                       | 76.6                      | 91.2                              | 69.9                          |
| Costa Rica                      | 87.6                       | 89.0                      | 94.2                              | 83.8                          | 89.1                       | 89.5                      | 91.7                              | 82.1                          |
| Croatia                         | 90.5                       | 90.5                      | 82.6                              | 74.8                          | 90.7                       | 90.7                      | 80.3                              | 72.9                          |
| Cyprus                          | 99.0                       | 99.0                      | 91.2                              | 90.3                          | 99.2                       | 99.2                      | 90.3                              | 89.5                          |
| Czechia                         | 99.7                       | 100.0                     | 98.4                              | 98.4                          | 99.9                       | 100.0                     | 98.3                              | 98.3                          |
| Denmark                         | 54.9                       | 79.7                      | 85.0                              | 67.8                          | 53.5                       | 80.0                      | 85.6                              | 68.5                          |
| Estonia                         | 97.5                       | 97.5                      | 89.1                              | 86.9                          | 97.6                       | 97.6                      | 88.8                              | 86.7                          |
| Finland                         | 99.6                       | 100.0                     | 94.8                              | 94.8                          | 99.6                       | 100.0                     | 94.1                              | 94.1                          |
| France                          | 80.2                       | 81.7                      | 76.4                              | 62.4                          | 80.3                       | 81.8                      | 75.7                              | 61.9                          |

| Participating country/territory | Unweighted                 |                           |                                   |                               | Weighted                   |                           |                                   |                               |
|---------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|
|                                 | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation |
| Hungary                         | 95.1                       | 95.5                      | 92.6                              | 88.4                          | 94.8                       | 95.5                      | 91.9                              | 87.8                          |
| Iceland                         | 94.2                       | 94.2                      | 81.6                              | 76.9                          | 93.8                       | 93.8                      | 81.5                              | 76.4                          |
| Israel                          | 92.0                       | 92.0                      | 87.4                              | 80.5                          | 90.7                       | 90.7                      | 84.4                              | 76.6                          |
| Italy                           | 98.5                       | 99.0                      | 92.4                              | 91.5                          | 98.7                       | 99.0                      | 92.0                              | 91.1                          |
| Japan                           | 90.2                       | 98.5                      | 97.7                              | 96.2                          | 91.2                       | 98.5                      | 97.5                              | 96.1                          |
| Kazakhstan                      | 99.7                       | 99.7                      | 99.5                              | 99.3                          | 99.8                       | 99.8                      | 99.6                              | 99.3                          |
| Korea                           | 65.3                       | 83.7                      | 91.0                              | 76.2                          | 63.1                       | 83.5                      | 89.9                              | 75.1                          |
| Kosovo                          | 99.1                       | 99.1                      | 91.4                              | 90.6                          | 99.2                       | 99.2                      | 87.0                              | 86.3                          |
| Latvia                          | 97.2                       | 98.6                      | 91.0                              | 89.8                          | 97.4                       | 98.9                      | 89.9                              | 88.9                          |
| Lithuania                       | 99.1                       | 99.5                      | 97.1                              | 96.6                          | 98.4                       | 99.6                      | 96.0                              | 95.6                          |
| Malta                           | 87.3                       | 87.3                      | 81.4                              | 71.0                          | 88.6                       | 88.6                      | 81.3                              | 72.0                          |
| Montenegro                      | 78.3                       | 78.3                      | 84.0                              | 65.7                          | 73.7                       | 73.7                      | 84.0                              | 61.9                          |
| Morocco                         | 99.7                       | 100.0                     | 98.3                              | 98.3                          | 99.2                       | 100.0                     | 98.1                              | 98.1                          |
| Netherlands                     | 37.6                       | 56.4                      | 73.7                              | 41.5                          | 34.9                       | 56.4                      | 71.0                              | 40.0                          |
| New Zealand                     | 27.9                       | 42.9                      | 71.7                              | 30.8                          | 28.1                       | 43.0                      | 73.1                              | 31.5                          |
| North Macedonia                 | 100.0                      | 100.0                     | 94.9                              | 94.9                          | 100.0                      | 100.0                     | 94.1                              | 94.1                          |
| Norway                          | 33.6                       | 53.1                      | 73.5                              | 39.0                          | 34.1                       | 53.9                      | 73.1                              | 39.4                          |
| Poland                          | 93.6                       | 99.6                      | 94.7                              | 94.4                          | 93.6                       | 99.5                      | 93.6                              | 93.1                          |
| Portugal                        | 98.7                       | 99.1                      | 92.2                              | 91.4                          | 98.9                       | 99.3                      | 91.7                              | 91.1                          |
| Romania                         | 100.0                      | 100.0                     | 97.4                              | 97.4                          | 100.0                      | 100.0                     | 96.1                              | 96.1                          |
| Saudi Arabia                    | 97.6                       | 97.6                      | 94.2                              | 92.0                          | 98.1                       | 98.1                      | 94.6                              | 92.8                          |
| Serbia                          | 98.5                       | 99.5                      | 95.6                              | 95.2                          | 98.5                       | 99.5                      | 94.7                              | 94.2                          |
| Shanghai (China)                | 100.0                      | 100.0                     | 98.4                              | 98.4                          | 100.0                      | 100.0                     | 98.4                              | 98.4                          |
| Singapore                       | 96.9                       | 98.1                      | 97.2                              | 95.3                          | 94.3                       | 96.4                      | 96.9                              | 93.4                          |

| Participating country/territory | Unweighted                 |                           |                                   |                               | Weighted                   |                           |                                   |                               |
|---------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|
|                                 | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation |
| Slovak Republic                 | 97.1                       | 100.0                     | 96.1                              | 96.1                          | 96.9                       | 100.0                     | 95.6                              | 95.6                          |
| Slovenia                        | 83.0                       | 84.1                      | 88.8                              | 74.7                          | 82.7                       | 84.2                      | 89.1                              | 75.0                          |
| South Africa                    | 92.8                       | 93.3                      | 91.2                              | 85.0                          | 93.3                       | 93.6                      | 89.7                              | 84.0                          |
| Spain                           | 99.8                       | 100.0                     | 94.1                              | 94.1                          | 99.7                       | 100.0                     | 93.4                              | 93.4                          |
| Sweden                          | 92.7                       | 95.1                      | 76.4                              | 72.7                          | 92.4                       | 94.6                      | 74.9                              | 70.9                          |
| Türkiye                         | 99.6                       | 99.6                      | 97.2                              | 96.8                          | 99.6                       | 99.6                      | 96.9                              | 96.6                          |
| United Arab Emirates            | 99.5                       | 99.5                      | 98.4                              | 97.9                          | 99.7                       | 99.7                      | 97.3                              | 97.0                          |
| United States                   | 49.6                       | 60.2                      | 82.8                              | 49.8                          | 48.9                       | 58.7                      | 81.8                              | 48.0                          |
| Uzbekistan                      | 100.0                      | 100.0                     | 98.6                              | 98.6                          | 100.0                      | 100.0                     | 98.7                              | 98.7                          |
| Viet Nam                        | 100.0                      | 100.0                     | 99.0                              | 99.0                          | 100.0                      | 100.0                     | 98.9                              | 98.9                          |

## Participation rates for ISCED level 1

**Table A F.3. Participation rates (%) for ISCED level 1 schools and principals**

| Participating country/territory | Unweighted         |                   | Weighted           |                   |
|---------------------------------|--------------------|-------------------|--------------------|-------------------|
|                                 | Before replacement | After replacement | Before replacement | After replacement |
| Australia                       | 63.0               | 85.6              | 64.8               | 85.3              |
| Belgium                         | 61.1               | 81.0              | 58.4               | 80.0              |
| Flemish Community (Belgium)     | 46.4               | 75.6              | 46.1               | 75.6              |
| French Community (Belgium)      | 76.2               | 86.6              | 74.8               | 85.8              |
| Brazil                          | 82.4               | 91.0              | 84.1               | 93.2              |
| France                          | 91.9               | 93.3              | 91.8               | 93.0              |
| Japan                           | 87.4               | 98.1              | 86.2               | 97.9              |
| Korea                           | 66.1               | 88.4              | 63.0               | 87.5              |
| Morocco                         | 98.7               | 98.7              | 98.4               | 98.4              |
| Netherlands                     | 44.3               | 68.0              | 43.8               | 68.3              |
| New Zealand                     | 33.9               | 57.6              | 34.8               | 58.1              |
| Saudi Arabia                    | 92.3               | 92.3              | 92.8               | 92.8              |
| Slovenia                        | 76.9               | 78.0              | 77.1               | 78.8              |
| Spain                           | 96.6               | 96.6              | 97.2               | 97.2              |
| Türkiye                         | 97.1               | 97.1              | 97.1               | 97.1              |
| United Arab Emirates            | 99.5               | 99.5              | 99.6               | 99.6              |

Table A F.4. Participation rates (%) for ISCED level 1 teachers

| Participating country/territory | Unweighted                 |                           |                                   |                               | Weighted                   |                           |                                   |                               |
|---------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|
|                                 | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation |
| Australia                       | 63.0                       | 85.6                      | 89.9                              | 76.9                          | 62.4                       | 85.4                      | 89.7                              | 76.6                          |
| Belgium                         | 59.9                       | 79.3                      | 84.2                              | 66.8                          | 56.6                       | 77.4                      | 83.3                              | 64.5                          |
| Flemish Community (Belgium)     | 42.1                       | 69.9                      | 88.0                              | 61.5                          | 42.1                       | 69.7                      | 87.7                              | 61.1                          |
| French Community (Belgium)      | 78.2                       | 89.1                      | 81.3                              | 72.4                          | 78.1                       | 88.7                      | 78.5                              | 69.6                          |
| Brazil                          | 80.8                       | 89.4                      | 96.4                              | 86.2                          | 81.0                       | 90.9                      | 97.4                              | 88.5                          |
| France                          | 88.7                       | 91.2                      | 88.7                              | 80.9                          | 89.1                       | 91.2                      | 88.9                              | 81.1                          |
| Japan                           | 87.4                       | 98.1                      | 97.9                              | 96.0                          | 87.9                       | 98.0                      | 97.8                              | 95.9                          |
| Korea                           | 60.3                       | 82.1                      | 90.6                              | 74.4                          | 59.9                       | 81.9                      | 89.8                              | 73.6                          |
| Morocco                         | 100.0                      | 100.0                     | 98.8                              | 98.8                          | 100.0                      | 100.0                     | 99.1                              | 99.1                          |
| Netherlands                     | 46.9                       | 72.2                      | 85.3                              | 61.6                          | 46.5                       | 72.2                      | 85.0                              | 61.3                          |
| New Zealand                     | 30.3                       | 53.3                      | 80.2                              | 42.7                          | 30.6                       | 54.7                      | 79.5                              | 43.5                          |
| Saudi Arabia                    | 98.6                       | 98.6                      | 94.7                              | 93.4                          | 99.1                       | 99.1                      | 94.6                              | 93.8                          |
| Slovenia                        | 82.2                       | 83.3                      | 91.3                              | 76.1                          | 81.8                       | 83.5                      | 91.5                              | 76.4                          |
| Spain                           | 99.2                       | 99.2                      | 94.7                              | 94.0                          | 99.0                       | 99.0                      | 93.0                              | 92.1                          |
| Türkiye                         | 97.5                       | 97.5                      | 96.3                              | 93.9                          | 97.3                       | 97.3                      | 96.3                              | 93.7                          |
| United Arab Emirates            | 99.5                       | 99.5                      | 97.5                              | 97.0                          | 99.5                       | 99.5                      | 96.8                              | 96.2                          |

## Participation rates for ISCED level 3

**Table A F.5. Participation rates (%) for ISCED level 3 schools and principals**

| Participating country/territory | Unweighted         |                   | Weighted           |                   |
|---------------------------------|--------------------|-------------------|--------------------|-------------------|
|                                 | Before replacement | After replacement | Before replacement | After replacement |
| Croatia                         | 90.0               | 90.0              | 90.0               | 90.0              |
| Denmark                         | 61.1               | 76.5              | 54.4               | 77.1              |
| Flemish Community (Belgium)     | 47.6               | 65.2              | 45.5               | 65.0              |
| Portugal                        | 99.5               | 100.0             | 98.9               | 100.0             |
| Saudi Arabia                    | 91.5               | 91.5              | 92.5               | 92.5              |
| Slovenia                        | 74.3               | 74.3              | 74.3               | 74.3              |
| Türkiye                         | 97.0               | 97.0              | 96.3               | 96.3              |
| United Arab Emirates            | 98.0               | 98.0              | 98.3               | 98.3              |

Table A F.6. Participation rates (%) for ISCED level 3 teachers

| Participating country/territory | Unweighted                 |                           |                                   |                               | Weighted                   |                           |                                   |                               |
|---------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|
|                                 | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation |
| Croatia                         | 96.0                       | 96.0                      | 85.7                              | 82.3                          | 95.9                       | 95.9                      | 85.0                              | 81.5                          |
| Denmark                         | 61.5                       | 76.5                      | 87.6                              | 67.0                          | 58.3                       | 79.3                      | 86.1                              | 68.3                          |
| Flemish Community (Belgium)     | 50.5                       | 67.1                      | 86.5                              | 58.1                          | 50.7                       | 67.2                      | 86.0                              | 57.8                          |
| Portugal                        | 99.5                       | 100.0                     | 93.9                              | 93.9                          | 99.6                       | 100.0                     | 93.9                              | 93.9                          |
| Saudi Arabia                    | 96.6                       | 96.6                      | 94.3                              | 91.1                          | 98.7                       | 98.7                      | 94.1                              | 92.9                          |
| Slovenia                        | 80.7                       | 80.7                      | 83.4                              | 67.4                          | 79.9                       | 79.9                      | 82.6                              | 66.0                          |
| Türkiye                         | 99.0                       | 99.0                      | 95.5                              | 94.5                          | 99.2                       | 99.2                      | 95.1                              | 94.3                          |
| United Arab Emirates            | 99.5                       | 99.5                      | 98.8                              | 98.3                          | 99.6                       | 99.6                      | 98.6                              | 98.2                          |



## Participation rates for the Teacher Knowledge Survey (TKS)

Table A F.7. Participation rates (%) for TKS teachers

| Participating country/territory | Unweighted                 |                           |                                   |                               | Weighted                   |                           |                                   |                               |
|---------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|
|                                 | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation |
| Chile                           | 57.6                       | 73.8                      | 79.9                              | 59.0                          | 64.4                       | 78.5                      | 80.5                              | 63.2                          |
| Croatia                         | 88.5                       | 88.5                      | 81.6                              | 72.2                          | 88.8                       | 88.8                      | 80.3                              | 71.3                          |
| Morocco                         | 99.7                       | 100.0                     | 98.5                              | 98.5                          | 99.3                       | 100.0                     | 98.1                              | 98.1                          |
| Poland                          | 93.6                       | 99.6                      | 94.8                              | 94.4                          | 93.5                       | 99.5                      | 93.5                              | 93.0                          |
| Portugal                        | 98.7                       | 99.1                      | 91.6                              | 90.8                          | 98.9                       | 99.3                      | 91.0                              | 90.3                          |
| Saudi Arabia                    | 98.5                       | 98.5                      | 93.5                              | 92.1                          | 98.6                       | 98.6                      | 93.4                              | 92.1                          |
| South Africa                    | 92.7                       | 93.2                      | 91.5                              | 85.3                          | 93.2                       | 93.4                      | 90.0                              | 84.1                          |
| United States                   | 46.5                       | 56.6                      | 79.7                              | 45.1                          | 46.1                       | 55.4                      | 79.9                              | 44.3                          |

## Participation rates for ISCED level 02

**Table A F.8. Participation rates (%) for ISCED level 02 settings and leaders**

| Participating country/territory | Unweighted         |                   | Weighted           |                   |
|---------------------------------|--------------------|-------------------|--------------------|-------------------|
|                                 | Before replacement | After replacement | Before replacement | After replacement |
| Chile                           | 68.9               | 81.6              | 78.6               | 88.3              |
| Colombia                        | 55.2               | 68.3              | 52.9               | 65.6              |
| Denmark                         | 55.5               | 82.4              | 52.9               | 82.0              |
| Finland                         | 92.4               | 97.1              | 92.9               | 96.9              |
| Flemish Community (Belgium)     | 64.2               | 83.2              | 62.7               | 83.2              |
| Germany                         | 45.2               | 70.1              | 45.2               | 70.3              |
| Ireland                         | 36.0               | 59.9              | 37.1               | 59.7              |
| Israel                          | 86.1               | 92.2              | 86.0               | 92.2              |
| Japan                           | 71.4               | 95.0              | 67.9               | 94.2              |
| Morocco                         | 93.1               | 98.2              | 93.3               | 98.3              |
| New Zealand                     | 17.9               | 20.7              | 19.7               | 22.9              |
| Norway                          | 30.6               | 45.2              | 31.5               | 46.4              |
| Spain                           | 98.2               | 98.2              | 97.9               | 97.9              |
| Sweden                          | 91.5               | 92.5              | 91.7               | 92.8              |
| Türkiye                         | 98.5               | 98.5              | 99.4               | 99.4              |

Table A F.9. Participation rates (%) for ISCED level 02 staff

| Participating country/territory | Unweighted                 |                           |                                   |                               | Weighted                   |                           |                                   |                               |
|---------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|
|                                 | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation |
| Chile                           | 60.7                       | 73.0                      | 88.1                              | 64.3                          | 70.7                       | 79.5                      | 88.0                              | 70.0                          |
| Colombia                        | 53.5                       | 65.2                      | 95.3                              | 62.2                          | 55.3                       | 65.2                      | 97.7                              | 63.6                          |
| Denmark                         | 54.9                       | 81.3                      | 89.5                              | 72.8                          | 54.9                       | 81.3                      | 89.5                              | 72.8                          |
| Finland                         | 92.4                       | 97.1                      | 95.4                              | 92.7                          | 91.7                       | 97.2                      | 94.7                              | 92.1                          |
| Flemish Community (Belgium)     | 66.3                       | 86.3                      | 89.4                              | 77.2                          | 67.1                       | 86.4                      | 88.2                              | 76.2                          |
| Germany                         | 47.2                       | 72.1                      | 82.2                              | 59.3                          | 46.6                       | 72.4                      | 81.5                              | 59.0                          |
| Ireland                         | 41.6                       | 69.5                      | 73.9                              | 51.4                          | 44.0                       | 69.9                      | 71.6                              | 50.0                          |
| Israel                          | 87.7                       | 94.2                      | 86.1                              | 81.1                          | 88.1                       | 94.4                      | 82.5                              | 77.8                          |
| Japan                           | 71.4                       | 95.0                      | 98.9                              | 93.9                          | 65.9                       | 94.0                      | 98.9                              | 92.9                          |
| Morocco                         | 92.9                       | 97.9                      | 99.1                              | 97.0                          | 91.1                       | 98.0                      | 99.2                              | 97.2                          |
| New Zealand                     | 16.8                       | 19.0                      | 73.1                              | 13.9                          | 17.6                       | 20.4                      | 72.7                              | 14.8                          |
| Norway                          | 25.3                       | 36.6                      | 72.2                              | 26.4                          | 25.5                       | 37.6                      | 73.8                              | 27.8                          |
| Spain                           | 99.8                       | 99.8                      | 96.7                              | 96.5                          | 100.0                      | 100.0                     | 96.7                              | 96.7                          |
| Sweden                          | 96.7                       | 97.7                      | 86.0                              | 84.0                          | 97.0                       | 98.0                      | 86.2                              | 84.5                          |
| Türkiye                         | 97.8                       | 97.8                      | 98.4                              | 96.2                          | 97.7                       | 97.7                      | 97.9                              | 95.7                          |

## Participation rates for children under the age of three (U3)

Table A F.10. Participation rates (%) for U3 settings and leaders

| Participating country/territory | Unweighted         |                   | Weighted           |                   |
|---------------------------------|--------------------|-------------------|--------------------|-------------------|
|                                 | Before replacement | After replacement | Before replacement | After replacement |
| Flemish Community (Belgium)     | 34.2               | 52.7              | 34.9               | 53.4              |
| Germany                         | 49.3               | 74.0              | 49.5               | 74.2              |
| Ireland                         | 39.9               | 58.8              | 39.6               | 59.5              |
| Israel                          | 77.2               | 85.5              | 76.0               | 83.0              |
| New Brunswick (Canada)          | 31.9               | 35.7              | 31.3               | 35.9              |
| New Zealand                     | 19.6               | 23.8              | 21.1               | 24.8              |
| Norway                          | 28.0               | 40.9              | 27.5               | 40.8              |
| Quebec (Canada)                 | 22.0               | 49.1              | 23.4               | 59.8              |

Table A F.11. Participation rates (%) for U3 staff

| Participating country/territory | Unweighted                 |                           |                                   |                               | Weighted                   |                           |                                   |                               |
|---------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|----------------------------|---------------------------|-----------------------------------|-------------------------------|
|                                 | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation | Schools before replacement | Schools after replacement | Teachers in participating schools | Overall teacher participation |
| Flemish Community (Belgium)     | 34.6                       | 54.0                      | 82.2                              | 44.4                          | 35.8                       | 55.3                      | 83.6                              | 46.2                          |
| Germany                         | 50.2                       | 74.9                      | 88.6                              | 66.3                          | 50.5                       | 76.0                      | 87.8                              | 66.7                          |
| Ireland                         | 44.0                       | 66.3                      | 75.2                              | 49.8                          | 44.0                       | 66.4                      | 74.0                              | 49.1                          |
| Israel                          | 78.7                       | 87.9                      | 85.4                              | 75.1                          | 78.2                       | 88.4                      | 84.7                              | 74.9                          |
| New Brunswick (Canada)          | 33.6                       | 37.4                      | 86.8                              | 32.5                          | 34.7                       | 38.6                      | 85.4                              | 33.0                          |
| New Zealand                     | 18.2                       | 23.1                      | 74.5                              | 17.2                          | 17.8                       | 23.9                      | 73.0                              | 17.4                          |
| Norway                          | 25.3                       | 36.6                      | 71.8                              | 26.3                          | 26.2                       | 36.8                      | 73.4                              | 27.0                          |
| Quebec (Canada)                 | 20.8                       | 47.4                      | 68.4                              | 32.4                          | 23.3                       | 49.7                      | 75.0                              | 37.3                          |

## Annex G. Construction and validation of scales

**Table A G.1. Descriptive statistics of the TALIS core survey scale scores for the pooled ISCED level 2 data**

| Scale                 | Mean<br>(weighted) | Mean<br>(unweighted) | Standard<br>deviation<br>(unweighted) | Lowest score | Highest score |
|-----------------------|--------------------|----------------------|---------------------------------------|--------------|---------------|
| <b>Teacher scales</b> |                    |                      |                                       |              |               |
| T4PDSUBMP             | 9.874              | 9.926                | 2.013                                 | 6.521        | 13.488        |
| T4PDGENP              | 10.192             | 10.239               | 2.012                                 | 6.249        | 13.981        |
| T4PDIV                | 10.289             | 10.305               | 2.003                                 | 6.210        | 13.868        |
| T4PDBR                | 9.478              | 9.440                | 1.996                                 | 5.475        | 14.529        |
| T4COLES               | 8.990              | 8.992                | 2.040                                 | 4.716        | 14.661        |
| T4EXINF               | 11.106             | 11.107               | 2.012                                 | 5.889        | 14.517        |
| T4SEENG               | 12.196             | 12.171               | 2.006                                 | 4.837        | 14.963        |
| T4SEINS               | 12.909             | 12.893               | 2.001                                 | 4.916        | 15.589        |
| T4SECLS               | 12.863             | 12.830               | 2.011                                 | 5.176        | 15.373        |
| T4SEMUL               | 11.560             | 11.523               | 1.995                                 | 5.766        | 14.465        |
| T4GROMST              | 10.803             | 10.771               | 1.988                                 | 6.029        | 14.257        |
| T4SESEN               | 10.551             | 10.505               | 2.006                                 | 5.550        | 14.403        |
| T4COMSEL              | 12.171             | 12.138               | 1.997                                 | 5.828        | 15.022        |
| T4SEDRT               | 11.442             | 11.461               | 1.995                                 | 5.585        | 14.332        |
| T4BLFDRT              | 11.945             | 11.937               | 2.022                                 | 5.801        | 15.512        |
| T4ADVDR               | 10.772             | 10.796               | 2.007                                 | 4.965        | 15.110        |
| T4STESE               | 10.662             | 10.687               | 1.988                                 | 5.824        | 14.015        |
| T4TCHCLC              | 10.849             | 10.875               | 1.990                                 | 5.499        | 14.909        |
| T4CLAIN               | 12.889             | 12.904               | 1.993                                 | 5.402        | 15.569        |
| T4COGAC               | 10.194             | 10.188               | 2.000                                 | 4.656        | 14.888        |
| T4CLASM               | 11.651             | 11.676               | 1.981                                 | 5.919        | 14.174        |
| T4DRTWCI              | 9.261              | 9.293                | 2.014                                 | 5.140        | 14.318        |
| T4DRTIIA              | 9.475              | 9.510                | 2.015                                 | 5.700        | 14.081        |
| T4CLSDIS              | 7.729              | 7.733                | 2.000                                 | 5.347        | 13.336        |
| T4ADLE                | 12.567             | 12.535               | 1.993                                 | 5.066        | 15.524        |
| T4PBLE                | 11.764             | 11.760               | 1.993                                 | 5.395        | 15.241        |
| T4AUTCH               | 12.374             | 12.304               | 2.004                                 | 5.609        | 15.172        |
| T4FULFIL              | 12.389             | 12.356               | 2.000                                 | 4.926        | 15.578        |
| T4EMPS                | 12.775             | 12.689               | 2.012                                 | 5.411        | 15.196        |

| Scale                   | Mean<br>(weighted) | Mean<br>(unweighted) | Standard<br>deviation<br>(unweighted) | Lowest score | Highest score |
|-------------------------|--------------------|----------------------|---------------------------------------|--------------|---------------|
| T4SESEDEV               | 12.097             | 12.099               | 1.990                                 | 5.626        | 14.941        |
| T4OPPART                | 11.570             | 11.551               | 2.000                                 | 6.179        | 15.092        |
| T4TLEAD                 | 12.321             | 12.314               | 1.997                                 | 6.097        | 15.799        |
| T4STUD                  | 13.674             | 13.576               | 2.006                                 | 6.085        | 16.666        |
| T4RELEAD                | 12.669             | 12.668               | 1.989                                 | 6.735        | 15.242        |
| T4INSTLE                | 12.612             | 12.602               | 1.998                                 | 6.723        | 15.150        |
| T4CLIBUL                | 13.836             | 13.779               | 2.009                                 | 6.087        | 16.461        |
| T4STUHAR                | 8.561              | 8.576                | 1.979                                 | 5.369        | 14.352        |
| T4CHFAT                 | 8.512              | 8.498                | 1.987                                 | 4.817        | 13.573        |
| T4MOPU                  | 12.487             | 12.464               | 2.004                                 | 6.327        | 14.784        |
| T4MOSU                  | 13.248             | 13.211               | 2.007                                 | 5.974        | 15.200        |
| T4WELS                  | 9.191              | 9.176                | 2.002                                 | 5.778        | 13.650        |
| T4WLOADT                | 9.464              | 9.468                | 2.003                                 | 5.877        | 13.893        |
| T4STBEH                 | 9.146              | 9.157                | 1.996                                 | 5.722        | 13.342        |
| T4JSPROT                | 12.101             | 12.102               | 1.994                                 | 6.023        | 15.415        |
| T4JSENV                 | 11.843             | 11.814               | 1.998                                 | 6.056        | 14.651        |
| T4VALP                  | 9.108              | 9.141                | 2.023                                 | 6.046        | 14.115        |
| T4JOYTCH                | 14.045             | 14.010               | 2.006                                 | 6.379        | 16.314        |
| T4JOBSAT                | 10.000             | 9.984                | 1.995                                 | 3.155        | 13.533        |
| T4SELF                  | 10.000             | 9.972                | 2.007                                 | 1.164        | 13.053        |
| <b>Principal scales</b> |                    |                      |                                       |              |               |
| T4PLEADS                | 9.795              | 9.813                | 1.965                                 | 6.792        | 13.168        |
| T4PTLEAD                | 10.705             | 10.706               | 1.998                                 | 5.817        | 14.135        |
| T4POPPART               | 10.729             | 10.736               | 2.026                                 | 5.999        | 13.954        |
| T4PACADT                | 11.153             | 11.128               | 2.011                                 | 6.307        | 13.678        |
| T4PDELI                 | 8.959              | 9.143                | 2.002                                 | 5.995        | 13.591        |
| T4PDIVBF                | 12.059             | 12.028               | 2.004                                 | 6.631        | 13.733        |
| T4PLEADESE              | 10.665             | 10.703               | 1.970                                 | 5.778        | 14.089        |
| T4PATBRCC               | 8.708              | 8.736                | 1.991                                 | 5.600        | 13.705        |
| T4PINBRCC               | 8.966              | 8.963                | 2.006                                 | 5.935        | 13.443        |
| T4PWELS                 | 9.569              | 9.555                | 2.004                                 | 5.778        | 14.046        |
| T4PWLOAD                | 9.596              | 9.660                | 2.016                                 | 5.371        | 14.065        |
| T4PJSPROT               | 10.925             | 10.973               | 1.990                                 | 6.112        | 14.049        |
| T4PJSENV                | 11.671             | 11.706               | 2.009                                 | 6.168        | 13.915        |
| T4PJJOBSAT              | 10.000             | 10.048               | 1.999                                 | 4.090        | 13.106        |

Note: Alberta (Canada), the Flemish Community (Belgium), the French Community (Belgium), the Netherlands, New Zealand and Norway were excluded from the pooled ISCED level 2 data. Due to missing scale scores resulting from the non-administration of at least one item from the scale, Slovenia (for scale T4ADLE), Azerbaijan, Bahrain, Israel, Kazakhstan, Morocco, Singapore, Türkiye, the United Arab Emirates and Uzbekistan (for scale T4STUHAR) and Viet Nam (for scale T4WELS) were excluded from the pooled ISCED level 2 data as well. The weighted standard deviation of the international pooled ISCED level 2 data always equals 2.

ISCED: International Standard Classification of Education; TALIS: Teaching and Learning International Survey.

Source: OECD, TALIS 2024 database.

**Table A G.2. Descriptive statistics of the TALIS Starting Strong scale scores for the pooled ISCED level 02 data**

| Scale                | Mean<br>(weighted) | Mean<br>(unweighted) | Standard<br>deviation<br>(unweighted) | Lowest score | Highest score |
|----------------------|--------------------|----------------------|---------------------------------------|--------------|---------------|
| <b>Staff scales</b>  |                    |                      |                                       |              |               |
| S2PDNPED             | 9.801              | 9.871                | 1.962                                 | 6.159        | 13.908        |
| S2PDIVR              | 10.393             | 10.483               | 1.969                                 | 6.711        | 13.943        |
| S2PAAD               | 9.217              | 9.302                | 2.029                                 | 5.038        | 14.206        |
| S2SELF               | 10.852             | 10.837               | 2.027                                 | 5.801        | 14.697        |
| S2SELFCE             | 11.473             | 11.460               | 2.022                                 | 6.349        | 14.268        |
| S2PROLIR             | 10.968             | 11.041               | 2.029                                 | 5.286        | 15.028        |
| S2PRONUR             | 10.032             | 10.141               | 2.055                                 | 5.762        | 14.284        |
| S2PRSOC              | 13.279             | 13.330               | 2.002                                 | 6.175        | 14.845        |
| S2PRINTR             | 12.012             | 12.013               | 2.003                                 | 6.394        | 14.335        |
| S2CCAFL              | 11.178             | 11.199               | 2.026                                 | 6.312        | 14.176        |
| S2PREMR              | 12.568             | 12.641               | 1.976                                 | 6.057        | 14.250        |
| S2PRLANR             | 12.590             | 12.765               | 2.014                                 | 6.268        | 15.709        |
| S2PRACTR             | 11.671             | 11.777               | 1.982                                 | 5.998        | 15.110        |
| S2SOCIALR            | 13.028             | 13.191               | 1.985                                 | 6.425        | 15.745        |
| S2COLLR              | 11.021             | 11.027               | 1.976                                 | 5.381        | 15.240        |
| S2PARENUR            | 10.899             | 10.913               | 1.976                                 | 5.743        | 15.198        |
| S2SSLEAD             | 12.292             | 12.286               | 2.019                                 | 5.973        | 15.149        |
| S2JOBSAR             | 12.696             | 12.694               | 2.013                                 | 6.083        | 15.424        |
| S2PROSAR             | 12.550             | 12.520               | 1.999                                 | 4.948        | 14.805        |
| S2STRESS             | 8.981              | 8.961                | 1.967                                 | 5.406        | 13.679        |
| S2STRESO             | 9.551              | 9.611                | 1.963                                 | 5.326        | 14.177        |
| S2STRESC             | 9.364              | 9.399                | 1.964                                 | 5.454        | 14.010        |
| S2STRESR             | 10.000             | 10.053               | 1.959                                 | 5.490        | 15.144        |
| <b>Leader scales</b> |                    |                      |                                       |              |               |
| S2LDLEAD             | 10.375             | 10.297               | 2.030                                 | 5.513        | 14.521        |
| S2LEADSPL1           | 9.678              | 9.671                | 2.001                                 | 6.130        | 13.802        |
| S2LEADSPL2           | 9.007              | 9.064                | 2.057                                 | 4.211        | 14.196        |
| S2LJOBSAR            | 11.290             | 11.305               | 1.997                                 | 6.082        | 14.297        |
| S2LNIGHBR            | 8.398              | 8.362                | 1.997                                 | 5.075        | 13.921        |
| S2LPDEV              | 10.119             | 10.234               | 2.082                                 | 4.917        | 15.181        |
| S2LPDLS              | 10.396             | 10.412               | 2.058                                 | 6.174        | 14.116        |
| S2LPDPL              | 10.009             | 10.133               | 2.078                                 | 5.097        | 14.874        |
| S2LSQPRS             | 9.303              | 9.313                | 2.108                                 | 6.513        | 13.216        |
| S2LSQSET             | 11.662             | 11.747               | 2.015                                 | 6.142        | 14.475        |
| S2LSQSTA             | 8.712              | 8.631                | 2.093                                 | 5.144        | 14.096        |
| S2LSTRESG            | 9.589              | 9.523                | 2.080                                 | 4.409        | 15.153        |
| S2LSTRESL            | 9.302              | 9.193                | 2.013                                 | 5.486        | 14.070        |
| S2LSTRESP            | 9.560              | 9.599                | 2.070                                 | 5.063        | 14.535        |
| S2LSTRES             | 10.000             | 10.006               | 2.079                                 | 4.447        | 15.939        |
| S2LDLEAD             | 10.375             | 10.297               | 2.030                                 | 5.513        | 14.521        |

Note: New Zealand was excluded from the pooled ISCED level 02 data. Due to missing scale scores resulting from the non-administration of at least one of the items from the scale, Israel was excluded from the pooled ISCED level 02 data for scales S2LSTRESG and S2LSTRESP as well. The weighted standard deviation of the international pooled ISCED level 02 data always equals 2.



Source: OECD, TALIS 2024 database.

Table A G.3. Descriptive statistics of the scale scores specific to the TKS for the international pooled data

| Scale               | Mean<br>(weighted) | Mean<br>(unweighted) | Standard<br>deviation<br>(unweighted) | Lowest score | Highest score |
|---------------------|--------------------|----------------------|---------------------------------------|--------------|---------------|
| TKS specific scales |                    |                      |                                       |              |               |
| T4OTLAS             | 11.005             | 10.982               | 1.974                                 | 5.491        | 14.610        |
| T4OTLAP             | 10.261             | 10.225               | 1.999                                 | 5.268        | 14.487        |
| T4OTLCI             | 11.284             | 11.306               | 1.985                                 | 5.270        | 14.825        |
| T4OTLSL             | 10.649             | 10.634               | 2.014                                 | 5.236        | 14.614        |

Note: The weighted standard deviation of the international pooled data always equals 2.

TKS: Teacher Knowledge Survey.

Source: OECD, TALIS 2024 database.

## Annex H. Coding for conditioning

| Variable      | Variable label                                          | Response options                                                                                                                                                                                                                                                | Conditioning variables                                       |                   |
|---------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------|
|               |                                                         |                                                                                                                                                                                                                                                                 | Scaling variable                                             | Missing indicator |
| IDLANG_TQ     | Language of uestionnaire                                | 1: English; 53: Arabic                                                                                                                                                                                                                                          | <i>Saudi Arabia only:</i> Dummy coding (English=1, Arabic=0) | No missing values |
| SubjectDomain | Main Subject Domain                                     | 1: Language & Arts; 2: Human Sciences; 3: Mathematics & Science; 4: Other                                                                                                                                                                                       | Dummy coding of categories (3 dummies, 1, M = reference)     | Valid=0, M=1      |
| GPK_Mean      | GPK average of all other teachers at the school         | IRT scores (WLE)                                                                                                                                                                                                                                                | As is                                                        | No missing values |
| NR_Number     | Number of not reached responses                         | Raw numbers                                                                                                                                                                                                                                                     | As is                                                        | No missing values |
| IDSTRATE      | Explicit sampling strata                                | Country-specific categories                                                                                                                                                                                                                                     | Dummy coding (largest stratum as reference category)         | No missing values |
| TT4G01        | Background/ Gender                                      | 1: Female; 2: Male; 3: <country-specific>                                                                                                                                                                                                                       | 1=1, 2, 3=0, M=0                                             | Valid=0, M=1      |
| TT4G02        | Background/ Age                                         | Calendar years (open-ended)                                                                                                                                                                                                                                     | M=Mean, else=copy                                            | Valid=0, M=1      |
| TT4G03        | Background/ Highest level of formal education completed | 1: Below <ISCED 2011 Level 3>; 2: <ISCED 2011 Level 3>; 3: <ISCED 2011 Level 4>; 4: <ISCED 2011 Level 5>; 5: <ISCED 2011 Level 6>; 6: <ISCED 2011 Level 7>; 7: <ISCED 2011 Level 8>                                                                             | Dummy coding of categories (6, with cat. 4 as reference)     | Valid=0, M=1      |
| TT4G04        | Background/ First teaching qualification                | 1: A <regular teacher education or training programme>; 2: A <fast-track/shorter or specialised teacher education or training programme>; 3: Subject-specific <education or training> only; 4: I have another formal qualification not listed above.; 5: I have | Dummy coding of categories (4, with cat. 1 as reference)     | Valid=0, M=1      |

| Variable  | Variable label                                                                                                          | Response options                                                                                      | Conditioning variables |                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|------------------------|-------------------|
|           |                                                                                                                         |                                                                                                       | Scaling variable       | Missing indicator |
|           |                                                                                                                         | no formal qualification related to the subject I am teaching or to any type of pedagogical education. |                        |                   |
| TT4G05    | Background/ Year of completion first teaching qualification                                                             | Calendar years (open-ended)                                                                           | M=Median, else=copy    | Valid=0, M=1      |
| TT4G08    | Background/ Teaching as the first choice as a career                                                                    | 1: Yes; 2: No                                                                                         | 1=1, 2=0, M=0          | Valid=0, M=1      |
| TT4G13B   | Current Work/ Years of work experience, regardless of full-time or part-time/ As a teacher in total                     | Number of years (open-ended)                                                                          | M=Mean, else=copy      | Valid=0, M=1      |
| TT4G13C   | Current Work/ Years of work experience, regardless of full-time or part-time/ In other education roles                  | Number of years (open-ended)                                                                          | M=Mean, else=copy      | Valid=0, M=1      |
| TT4G13D   | Current Work/ Years of work experience, regardless of full-time or part-time/ Other non-education roles                 | Number of years (open-ended)                                                                          | M=Mean, else=copy      | Valid=0, M=1      |
| KTA4G08A1 | Background/ Formal <education or training>/ Reading, writing and literature/ Included in formal <education or training> | 1: Checked; 2: Not checked                                                                            | 1=1, 2=0, M=0          | Valid=0, M=1      |
| KTA4G08A2 | Background/ Formal <education or training>/ Reading, writing and literature/ I teach it to students this year           | 1: Checked; 2: Not checked                                                                            | 1=1, 2=0, M=0          | Valid=0, M=1      |
| KTA4G08B1 | Background/ Formal <education or training>/ Mathematics/ Included in formal <education or training>                     | 1: Checked; 2: Not checked                                                                            | 1=1, 2=0, M=0          | Valid=0, M=1      |
| KTA4G08B2 | Background/ Formal <education or training>/ Mathematics/ I teach it to students this year                               | 1: Checked; 2: Not checked                                                                            | 1=1, 2=0, M=0          | Valid=0, M=1      |
| KTA4G08C1 | Background/ Formal <education or training>/ Science/ Included in formal <education or training>                         | 1: Checked; 2: Not checked                                                                            | 1=1, 2=0, M=0          | Valid=0, M=1      |
| KTA4G08C2 | Background/ Formal <education or training>/ Science/ I teach it to students this year                                   | 1: Checked; 2: Not checked                                                                            | 1=1, 2=0, M=0          | Valid=0, M=1      |
| KTA4G08D1 | Background/ Formal <education or training>/ Social studies/ Included in formal <education or training>                  | 1: Checked; 2: Not checked                                                                            | 1=1, 2=0, M=0          | Valid=0, M=1      |
| KTA4G08D2 | Background/ Formal <education or training>/ Social studies/ I teach it to students this year                            | 1: Checked; 2: Not checked                                                                            | 1=1, 2=0, M=0          | Valid=0, M=1      |
| KTA4G08E1 | Background/ Formal <education or training>/ Modern foreign languages/ Included in formal <education or training>        | 1: Checked; 2: Not checked                                                                            | 1=1, 2=0, M=0          | Valid=0, M=1      |
| KTA4G08E2 | Background/ Formal <education or training>/ Modern foreign languages/ I teach it to students this year                  | 1: Checked; 2: Not checked                                                                            | 1=1, 2=0, M=0          | Valid=0, M=1      |
| KTA4G08F1 | Background/ Formal <education or training>/ Ancient Greek and/or Latin/ Included in formal <education or training>      | 1: Checked; 2: Not checked                                                                            | 1=1, 2=0, M=0          | Valid=0, M=1      |

| Variable  | Variable label                                                                                                          | Response options                                           | Conditioning variables       |                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------|-------------------|
|           |                                                                                                                         |                                                            | Scaling variable             | Missing indicator |
| KTA4G08F2 | Background/ Formal <education or training>/ Ancient Greek and/or Latin/ I teach it to students this year                | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08G1 | Background/ Formal <education or training>/ Technology/ Included in formal <education or training>                      | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08G2 | Background/ Formal <education or training>/ Technology/ I teach it to students this year                                | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08H1 | Background/ Formal <education or training>/ Arts/ Included in formal <education or training>                            | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08H2 | Background/ Formal <education or training>/ Arts/ I teach it to students this year                                      | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08I1 | Background/ Formal <education or training>/ Physical education/ Included in formal <education or training>              | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08I2 | Background/ Formal <education or training>/ Physical education/ I teach it to students this year                        | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08J1 | Background/ Formal <education or training>/ Religion and/or ethics/ Included in formal <education or training>          | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08J2 | Background/ Formal <education or training>/ Religion and/or ethics/ I teach it to students this year                    | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08K1 | Background/ Formal <education or training>/ Practical and vocational skills/ Included in formal <education or training> | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08K2 | Background/ Formal <education or training>/ Practical and vocational skills/ I teach it to students this year           | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08L1 | Background/ Formal <education or training>/ Other/ Included my formal <education or training>                           | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| KTA4G08L2 | Background/ Formal <education or training>/ Other/ I teach it to students this year                                     | 1: Checked; 2: Not checked                                 | 1=1, 2=0, M=0                | Valid=0, M=1      |
| TT4G10    | Current Work/ Currently working as a teacher of <ISCED 2011 level x> at another school                                  | 1: Yes; 2: No                                              | 1=1, 2=0, M=0                | Valid=0, M=1      |
| TT4G11    | Current Work/ Count of other schools currently work as a <ISCED 2011 level x> teacher                                   | Number of schools (open-ended)                             | M=Mean, else=copy            | Valid=0, M=1      |
| KT4G111A  | Opportunities to learn/ Classroom instruction/ Lesson design                                                            | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KT4G111B  | Opportunities to learn/ Classroom instruction/ Long-term planning                                                       | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KT4G111C  | Opportunities to learn/ Classroom instruction/ Time management in the classroom                                         | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |

| Variable  | Variable label                                                                            | Response options                                           | Conditioning variables       |                   |
|-----------|-------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------|-------------------|
|           |                                                                                           |                                                            | Scaling variable             | Missing indicator |
| KTB4G111D | Opportunities to learn/ Classroom instruction/ Student behaviour and classroom management | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G111E | Opportunities to learn/ Classroom instruction/ Collaborative learning                     | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G111F | Opportunities to learn/ Classroom instruction/ Adaptive teaching                          | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G111G | Opportunities to learn/ Classroom instruction/ Classroom discourse and dialogue           | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G111H | Opportunities to learn/ Classroom instruction/ Setting clear learning expectations        | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G111I | Opportunities to learn/ Classroom instruction/ Student-centred approaches                 | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G111J | Opportunities to learn/ Classroom instruction/ Teaching clarity                           | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G121A | Opportunities to learn/ Student learning/ Educational theories of learning                | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G121B | Opportunities to learn/ Student learning/ Student individual differences                  | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G121C | Opportunities to learn/ Student learning/ Identification of learning difficulties         | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G121D | Opportunities to learn/ Student learning/ Psychological theories of child development     | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G121E | Opportunities to learn/ Student learning/ Science of learning                             | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G121F | Opportunities to learn/ Student learning/ Taxonomies of learning                          | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G121G | Opportunities to learn/ Student learning/ Self-regulated learning                         | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G121H | Opportunities to learn/ Student learning/ Affective-motivational impacts on learning      | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G131A | Opportunities to learn/ Assessment/ Different purposes for assessment                     | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G131B | Opportunities to learn/ Assessment/ Standards used to assess students                     | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |

| Variable  | Variable label                                                                                              | Response options                                           | Conditioning variables       |                   |
|-----------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------|-------------------|
|           |                                                                                                             |                                                            | Scaling variable             | Missing indicator |
| KTB4G131C | Opportunities to learn/ Assessment/ Creating and using rubrics for assessment                               | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G131D | Opportunities to learn/ Assessment/ Peer and/or self-assessment                                             | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G131E | Opportunities to learn/ Assessment/ Standardised tests                                                      | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G131F | Opportunities to learn/ Assessment/ Grades and grading                                                      | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G131G | Opportunities to learn/ Assessment/ Providing effective feedback to students                                | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G131H | Opportunities to learn/ Assessment/ Data literacy                                                           | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G131I | Opportunities to learn/ Assessment/ Monitoring learning progress                                            | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G141A | Opportunities to learn/ Additional topics/ Teaching in a multicultural setting                              | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G141B | Opportunities to learn/ Additional topics/ Teaching in a multilingual setting                               | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G141C | Opportunities to learn/ Additional topics/ Teaching students socio-economically disadvantaged homes         | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G141F | Opportunities to learn/ Additional topics/ Methods for inclusion and inclusive pedagogies                   | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G141D | Opportunities to learn/ Additional topics/ Accommodating students with special education needs              | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G141E | Opportunities to learn/ Additional topics/ Identifying and/or meeting the learning needs of gifted students | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G141G | Opportunities to learn/ Additional topics/ Teaching cross-disciplinary                                      | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G141H | Opportunities to learn/ Additional topics/ Using <digital resources and tools> in instruction               | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G141I | Opportunities to learn/ Additional topics/ Classroom climate                                                | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| KTB4G141J | Opportunities to learn/ Additional topics/ Students' social and emotional development                       | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |

| Variable | Variable label                                                                                                        | Response options                                           | Conditioning variables       |                   |
|----------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------|-------------------|
|          |                                                                                                                       |                                                            | Scaling variable             | Missing indicator |
| KT4G141K | Opportunities to learn/ Additional topics/ Identifying and intervening                                                | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27A  | Teaching in General/ Self-efficacy in teaching/ Get students to believe they can do well in school work               | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27B  | Teaching in General/ Self-efficacy in teaching/ Help students value learning                                          | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27C  | Teaching in General/ Self-efficacy in teaching/ Craft good questions for students                                     | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27D  | Teaching in General/ Self-efficacy in teaching/ Control disruptive behaviour in the classroom                         | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27E  | Teaching in General/ Self-efficacy in teaching/ Motivate students who show low interest in school work                | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27F  | Teaching in General/ Self-efficacy in teaching/ Make my expectations about student behaviour clear                    | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27G  | Teaching in General/ Self-efficacy in teaching/ Help students think critically                                        | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27H  | Teaching in General/ Self-efficacy in teaching/ Get students to follow classroom rules                                | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27I  | Teaching in General/ Self-efficacy in teaching/ Calm a student who is disruptive or noisy                             | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27J  | Teaching in General/ Self-efficacy in teaching/ Use a variety of assessment strategies                                | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27K  | Teaching in General/ Self-efficacy in teaching/ Provide an altern. explanation for example when students are confused | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27L  | Teaching in General/ Self-efficacy in teaching/ Vary instructional strategies in my classroom                         | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27M  | Teaching in General/ Self-efficacy in teaching/ Support learning through the use of <digital resources and tools>     | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27N  | Teaching in General/ Self-efficacy in teaching/ Help every student progress                                           | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27O  | Teaching in General/ Self-efficacy in teaching/ Reduce achievement gaps among students                                | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G27P  | Teaching in General/ Self-efficacy in teaching/ Support students' social and emotional learning                       | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |

| Variable | Variable label                                                                                                          | Response options                                               | Conditioning variables       |                   |
|----------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|------------------------------|-------------------|
|          |                                                                                                                         |                                                                | Scaling variable             | Missing indicator |
| TT4G74   | Occupational Perceptions/ How many more years want to continue to work as a teacher                                     | Number of years (open-ended)                                   | M=Mean, else=copy            | Valid=0, M=1      |
| TT4G77A  | Occupational Perceptions/ Sources of stress in work/ Having too much lesson preparation                                 | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77B  | Occupational Perceptions/ Sources of stress in work/ Having too many lessons to teach                                   | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77C  | Occupational Perceptions/ Sources of stress in work/ Having too much marking                                            | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77D  | Occupational Perceptions/ Sources of stress in work/ Having too much administrative work to do (e.g. filling out forms) | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77E  | Occupational Perceptions/ Sources of stress in work/ Having extra duties due to absent teachers                         | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77F  | Occupational Perceptions/ Sources of stress in work/ Being held responsible for students' achievement                   | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77G  | Occupational Perceptions/ Sources of stress in work/ Maintaining classroom discipline                                   | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77H  | Occupational Perceptions/ Sources of stress in work/ Being intimidated or verbally abused by students                   | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77I  | Occupational Perceptions/ Sources of stress in work/ Keeping up with changing requirements from authorities             | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77J  | Occupational Perceptions/ Sources of stress in work/ Addressing parent or guardian concerns                             | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77K  | Occupational Perceptions/ Sources of stress in work/ Modifying lessons for students with special education needs        | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77L  | Occupational Perceptions/ Sources of stress in work/ Being held responsible for students' well-being                    | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77M  | Occupational Perceptions/ Sources of stress in work/ Keeping up with curriculum or programme changes in this school     | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77N  | Occupational Perceptions/ Sources of stress in work/ Having too much work on diversity and equity issues                | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G77P  | Occupational Perceptions/ Sources of stress in work/ Keeping up with professional learning                              | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot     | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G80A  | Occupational Perceptions/ Experience as a teacher/ I like the subject(s) that I teach                                   | 1: Strongly disagree; 2: Disagree; 3: Agree; 4: Strongly agree | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |



| Variable | Variable label                                                                                                    | Response options                                                                                                          | Conditioning variables                 |                   |
|----------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------|
|          |                                                                                                                   |                                                                                                                           | Scaling variable                       | Missing indicator |
| TT4G80B  | Occupational Perceptions/ Experience as a teacher/ I often feel happy while I teach                               | 1: Strongly disagree; 2: Disagree; 3: Agree; 4: Strongly agree                                                            | 1=0, 2=1, 3=2, 4=3, M=Median           | Valid=0, M=1      |
| TT4G80C  | Occupational Perceptions/ Experience as a teacher/ I generally teach with enthusiasm                              | 1: Strongly disagree; 2: Disagree; 3: Agree; 4: Strongly agree                                                            | 1=0, 2=1, 3=2, 4=3, M=Median           | Valid=0, M=1      |
| TT4G80D  | Occupational Perceptions/ Experience as a teacher/ The interesting challenges of teaching give me satisfaction    | 1: Strongly disagree; 2: Disagree; 3: Agree; 4: Strongly agree                                                            | 1=0, 2=1, 3=2, 4=3, M=Median           | Valid=0, M=1      |
| TT4G26A  | Teaching in General/ Engagement in collaborative activities/ Teach jointly as a team in the same class            | 1: Never; 2: Once a year or less; 3: 2-4 times a year; 4: 5-10 times a year; 5: 1-3 times a month; 6: Once a week or more | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, M=Median | Valid=0, M=1      |
| TT4G26B  | Teaching in General/ Engagement in collaborative activities/ Observe other teachers' classes and provide feedback | 1: Never; 2: Once a year or less; 3: 2-4 times a year; 4: 5-10 times a year; 5: 1-3 times a month; 6: Once a week or more | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, M=Median | Valid=0, M=1      |
| TT4G26C  | Teaching in General/ Engagement in collaborative activities/ Engage in joint activities                           | 1: Never; 2: Once a year or less; 3: 2-4 times a year; 4: 5-10 times a year; 5: 1-3 times a month; 6: Once a week or more | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, M=Median | Valid=0, M=1      |
| TT4G26D  | Teaching in General/ Engagement in collaborative activities/ Exchange teaching materials with colleagues          | 1: Never; 2: Once a year or less; 3: 2-4 times a year; 4: 5-10 times a year; 5: 1-3 times a month; 6: Once a week or more | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, M=Median | Valid=0, M=1      |
| TT4G26E  | Teaching in General/ Engagement in collaborative activities/ Engage in discussions about learning development     | 1: Never; 2: Once a year or less; 3: 2-4 times a year; 4: 5-10 times a year; 5: 1-3 times a month; 6: Once a week or more | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, M=Median | Valid=0, M=1      |
| TT4G26F  | Teaching in General/ Engagement in collaborative activities/ Work with other teachers to ensure common standards  | 1: Never; 2: Once a year or less; 3: 2-4 times a year; 4: 5-10 times a year; 5: 1-3 times a month; 6: Once a week or more | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, M=Median | Valid=0, M=1      |
| TT4G26G  | Teaching in General/ Engagement in collaborative activities/ Take part in collaborative professional learning     | 1: Never; 2: Once a year or less; 3: 2-4 times a year; 4: 5-10 times a year; 5: 1-3 times a month; 6: Once a week or more | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, M=Median | Valid=0, M=1      |
| TT4G26H  | Teaching in General/ Engagement in collaborative activities/ Collaborate with parents or guardians                | 1: Never; 2: Once a year or less; 3: 2-4 times a year; 4: 5-10 times a year; 5: 1-                                        | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, M=Median | Valid=0, M=1      |

| Variable | Variable label                                                                                                           | Response options                                                                          | Conditioning variables                      |                   |
|----------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|
|          |                                                                                                                          |                                                                                           | Scaling variable                            | Missing indicator |
|          |                                                                                                                          | 3 times a month; 6: Once a week or more                                                   |                                             |                   |
| TT4G46   | Teaching in the <Target Class>/ Enrollment in <target class>                                                             | Number of students (open-ended)                                                           | M=Mean, else=copy                           | Valid=0, M=1      |
| TT4G47A  | Teaching in the <Target Class>/ Percentage student characteristics/ Students with difficulties understanding instruction | 1: None; 2: 1% to 10%; 3: 11% to 30%; 4: 31% to 60%; 5: 61% to 90%; 6: 91% to 99%; 7: All | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, 7=6, M=Median | Valid=0, M=1      |
| TT4G47C  | Teaching in the <Target Class>/ Percentage student characteristics/ Low academic achievers                               | 1: None; 2: 1% to 10%; 3: 11% to 30%; 4: 31% to 60%; 5: 61% to 90%; 6: 91% to 99%; 7: All | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, 7=6, M=Median | Valid=0, M=1      |
| TT4G47E  | Teaching in the <Target Class>/ Percentage student characteristics/ Students with special education needs                | 1: None; 2: 1% to 10%; 3: 11% to 30%; 4: 31% to 60%; 5: 61% to 90%; 6: 91% to 99%; 7: All | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, 7=6, M=Median | Valid=0, M=1      |
| TT4G47F  | Teaching in the <Target Class>/ Percentage student characteristics/ Students with behavioural problems                   | 1: None; 2: 1% to 10%; 3: 11% to 30%; 4: 31% to 60%; 5: 61% to 90%; 6: 91% to 99%; 7: All | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, 7=6, M=Median | Valid=0, M=1      |
| TT4G47G  | Teaching in the <Target Class>/ Percentage student characteristics/ From <socio-economically disadvantaged homes>        | 1: None; 2: 1% to 10%; 3: 11% to 30%; 4: 31% to 60%; 5: 61% to 90%; 6: 91% to 99%; 7: All | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, 7=6, M=Median | Valid=0, M=1      |
| TT4G47I  | Teaching in the <Target Class>/ Percentage student characteristics/ Male students                                        | 1: None; 2: 1% to 10%; 3: 11% to 30%; 4: 31% to 60%; 5: 61% to 90%; 6: 91% to 99%; 7: All | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, 7=6, M=Median | Valid=0, M=1      |
| TT4G47J  | Teaching in the <Target Class>/ Percentage student characteristics/ Immigrants or with migrant background                | 1: None; 2: 1% to 10%; 3: 11% to 30%; 4: 31% to 60%; 5: 61% to 90%; 6: 91% to 99%; 7: All | 1=0, 2=1, 3=2, 4=3, 5=4, 6=5, 7=6, M=Median | Valid=0, M=1      |
| TT4G50A  | Teaching in the <Target Class>/ Percentage of <class> time typically spent on activities/ Administrative tasks           | Percentages (open-ended)                                                                  | M=Mean, else=copy                           | Valid=0, M=1      |
| TT4G50B  | Teaching in the <Target Class>/ Percentage of <class> time typically spent on activities/ Keeping order in classroom     | Percentages (open-ended)                                                                  | M=Mean, else=copy                           | Valid=0, M=1      |
| TT4G50C  | Teaching in the <Target Class>/ Percentage of <class> time typically spent on activities/ Actual teaching and learning   | Percentages (open-ended)                                                                  | M=Mean, else=copy                           | Valid=0, M=1      |
| TT4G51A  | Teaching in the <Target Class>/ Teaching practices/ I present a summary of recently learned content                      | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always                       | 1=0, 2=1, 3=2, 4=3, M=Median                | Valid=0, M=1      |
| TT4G51B  | Teaching in the <Target Class>/ Teaching practices/ I set goals at the beginning of instruction                          | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always                       | 1=0, 2=1, 3=2, 4=3, M=Median                | Valid=0, M=1      |

| Variable | Variable label                                                                                                           | Response options                                                    | Conditioning variables       |                   |
|----------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------|-------------------|
|          |                                                                                                                          |                                                                     | Scaling variable             | Missing indicator |
| TT4G51C  | Teaching in the <Target Class>/ Teaching practices/ I explain what I expect the students to learn                        | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51D  | Teaching in the <Target Class>/ Teaching practices/ I explain how new and old topics are related                         | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51E  | Teaching in the <Target Class>/ Teaching practices/ I present tasks for which there is no obvious solution               | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51F  | Teaching in the <Target Class>/ Teaching practices/ I give tasks that require students to think critically               | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51G  | Teaching in the <Target Class>/ Teaching practices/ I have students work in small groups to come up with a solution      | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51H  | Teaching in the <Target Class>/ Teaching practices/ I ask students to decide on own procedures for solving complex tasks | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51I  | Teaching in the <Target Class>/ Teaching practices/ I tell students to follow classroom rules                            | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51J  | Teaching in the <Target Class>/ Teaching practices/ I tell students to listen to what I say                              | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51K  | Teaching in the <Target Class>/ Teaching practices/ I calm students who are disruptive                                   | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51L  | Teaching in the <Target Class>/ Teaching practices/ When the lesson begins, I tell students to quiet down quickly        | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51M  | Teaching in the <Target Class>/ Teaching practices/ I refer to a problem from everyday life or work to demonstrate       | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51N  | Teaching in the <Target Class>/ Teaching practices/ I give students projects that require at least one week to complete  | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G51O  | Teaching in the <Target Class>/ Teaching practices/ I encourage students to question and critique arguments              | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G53A  | Teaching in the <Target Class>/ Use methods assessing student learning/ I administer an assessment                       | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G53B  | Teaching in the <Target Class>/ Use methods assessing student learning/ I give a <mark> to communicate to students       | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G53C  | Teaching in the <Target Class>/ Use methods assessing student learning/ I provide oral or written feedback               | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G53D  | Teaching in the <Target Class>/ Use methods assessing student learning/ I ask students to assess their own progress      | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |

| Variable | Variable label                                                                                                           | Response options                                                    | Conditioning variables       |                   |
|----------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------|-------------------|
|          |                                                                                                                          |                                                                     | Scaling variable             | Missing indicator |
| TT4G53E  | Teaching in the <Target Class>/ Use methods assessing student learning/ I observe students on tasks and provide feedback | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G53F  | Teaching in the <Target Class>/ Use methods assessing student learning/ I use assessments                                | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G55A  | Teaching in the <Target Class>/ Performed actions/ I consider students' prior knowledge and needs                        | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G55B  | Teaching in the <Target Class>/ Performed actions/ I point students to different materials                               | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G55C  | Teaching in the <Target Class>/ Performed actions/ I change my way of explaining                                         | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G55D  | Teaching in the <Target Class>/ Performed actions/ I adapt my teaching methods to students' needs                        | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G55E  | Teaching in the <Target Class>/ Performed actions/ I ask questions at various difficulty levels                          | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G56A  | Teaching in the <Target Class>/ Performed actions/ I let students review multiple examples                               | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G56B  | Teaching in the <Target Class>/ Performed actions/ I select tasks for student practice                                   | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G56C  | Teaching in the <Target Class>/ Performed actions/ I prepare students for difficulties                                   | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G56D  | Teaching in the <Target Class>/ Performed actions/ I let students practise similar tasks                                 | 1: Never or almost never; 2: Occasionally; 3: Frequently; 4: Always | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G58A  | Teaching in the <Target Class>/ Achieved aims/ Presenting the content in a comprehensible way                            | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot          | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G58B  | Teaching in the <Target Class>/ Achieved aims/ Engaging students in work that challenges them                            | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot          | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G58C  | Teaching in the <Target Class>/ Achieved aims/ Providing students with feedback to support their learning                | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot          | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G58D  | Teaching in the <Target Class>/ Achieved aims/ Offering students opportunities to practice what they learned             | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot          | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G58E  | Teaching in the <Target Class>/ Achieved aims/ Adapting teaching to meet the different needs of students                 | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot          | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |
| TT4G58F  | Teaching in the <Target Class>/ Achieved aims/ Helping students to manage their own emotions, thoughts, and behaviour    | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot          | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |

| Variable | Variable label                                                            | Response options                                           | Conditioning variables       |                   |
|----------|---------------------------------------------------------------------------|------------------------------------------------------------|------------------------------|-------------------|
|          |                                                                           |                                                            | Scaling variable             | Missing indicator |
| TT4G58G  | Teaching in the <Target Class>/ Achieved aims/ Managing student behaviour | 1: Not at all; 2: To some extent; 3: Quite a bit; 4: A lot | 1=0, 2=1, 3=2, 4=3, M=Median | Valid=0, M=1      |

