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PISA Strategic Development Group

**SYNTHESIS OF COMMENTS ON DRAFT PISA 2012 MATHEMATICS FRAMEWORK
(EDU/PISA/GB(2010)2 REV1)**

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SYNTHESIS OF COMMENTS ON DRAFT PISA 2012 MATHEMATICS FRAMEWORK (EDU/PISA/GB(2010)2 REV1)

Overview

By 9 June 2010, some 18 countries had commented on the draft framework document [EDU/PISA/GB(2010)2 REV1] sent to the PGB on 7 May 2010: Australia, Austria, Belgium (Fr), Canada, Chile, Denmark, France, Germany, Greece, Ireland, Korea, Mexico, Norway, Slovak Republic, Spain, Sweden, Switzerland and the United States.

Broadly countries have welcomed the changes made compared with the version circulated for the (cancelled) PGB meeting [EDU/PISA/GB(2010)2], though most countries made suggestions for some improvements in specific areas. Overall assessments ranged from “We are pleased with the revisions in the mathematical framework and we have no objections at this point” (Sweden) to “The draft of the mathematics framework is on our eyes not convincing” (Switzerland), the latter of which was supported by the United States.

The draft contained a number of text boxes raising issues on which the PGB’s views were sought. The comments received on each of these are summarised below. They are not intended to be exhaustive but rather convey a picture of where there is support for the proposals in the draft and where there is not.

General comments

- The addition of references to the research literature is welcome; they should be listed in full at the end of the draft (Austria, Belgium)
- Ensure consistent labelling throughout- example of Figures 1,2 and 3 being inconsistent; suggests improvements (Austria)
- ‘Attitudes towards mathematics’ section needs further clarification of definitions and differences with PISA 2003 (Belgium)
- Add a lexicon or glossary to define and clarify terms used (Canada)
- There is no mention of the theoretical basis (sociocultural approach) of the framework (Ireland)
- There is a danger that if too much of the context of problems is stripped away in order to make the mathematics involved more obvious much of the uniqueness of PISA mathematics and its mathematical modelling approach will be lost (Ireland)
- It appears as if the Achieve approach has been superimposed upon the former approach rather than integrated (United States)
- Require more discussion of trends in the framework- the extent to which trends will be maintained and how (United States)

Definition of the domain

- New definition satisfactory but need more clarity about students' use of calculators in test (France, Mexico)
- Difficulty in translating “literacy” in Spanish; prefer the concept of “mathematical competence” (Spain)
- Suggests a rewording of the definition of mathematical literacy, combining the two sentences into one. Request for clarification/elaboration of some terms and concepts (Denmark)
- ‘Mathematics is a continuum’ is an important element in the definition (Korea)
- In order to simplify the definition the second part relating to mathematical literacy as a continuum could be removed and included in explanatory remarks section (Ireland)
- Not content with the change in definition of terms in this revision, which effectively mean that mathematical literacy is now narrowly defined as “modelling” (United States)

Concept of mathematical modelling cycle (Box para. 13)

- Support; add the clarification given in the box into the framework text (Austria, France, Norway)

Content category labels (Box para 31)

- Support the proposed categories, including the importance of “focus on broad mathematical phenomena, rather than narrow curriculum topics.” (Austria, Canada, Denmark, Norway, Switzerland)
- Need further definition of the content categories (Mexico)

Content topics (Box para 48)

- Concerns about representativeness of countries studied to derive the lists of topics (Austria, France, Spain, Switzerland, United States)
- Need assurance that content standards are guided by a forward looking notion of the challenges facing 15 year olds as young adults; should not push PISA to a curriculum driven assessment (United States)
- Request for more information about what information was collected from the nine countries (Ireland)
- Some concern about mismatch with national curriculum (France)
- Support the need for analysis of the descriptions before finalising (Denmark)
- How do the content topics map to the four Content categories? Need to clarify how the content topics will be used (Switzerland)

Structure and labels of reporting categories (Box para 49)

- Supports proposed categories and labels (Austria, Australia, Chile, Denmark)
- Splitting ‘Identify and Interpret’ into two categories could be jeopardised by insufficient numbers of items assessing each category? Also, descriptions need to be explicit and clear (France)
- Supports splitting the ‘Identify and Interpret’ category into two (Greece)
- Does not support splitting ‘Identify and Interpret’ category (Switzerland)
- Need still further evidence to support the model; possible concern that not all existing items can be mapped to these categories (Australia)
- ‘Modelling with mathematics’ needs further clarification (Norway)
- Suggest relabeling ‘Modelling with mathematics’ as ‘Mathematic modelling’ (Austria)
- If ‘Modelling with mathematics’ cannot be reported then only two reporting categories is not very useful (Canada)
- The alternative choices for reporting categories need to be more explicit with supporting arguments before a decision can be taken (Mexico)
- Draft framework could usefully give additional information on how to rate competency levels (Korea)
- The linking of the reporting categories to the modelling cycle is good but may be difficult and elusive when used to classify PISA items; also PISA 2003 items should be classified to the framework to test links between 2003 and 2012 (Ireland)
- Not content with proposed reporting categories. How widely accepted are they? Discussion of cognitive complexity should be tied to the reporting categories to help policy makers understand the categories (United States).

Fundamental mathematical abilities (Box para 64)

- Support this terminology and concepts (Canada, France, Chile, Norway)
- Support the term “Processes” instead of “abilities” (Spain)
- Supports the overall term “Fundamental mathematical abilities” but sees problems with the labelling for the “Communication” (Austria and Greece) and “Using mathematical tools” abilities (Greece)
- Does not feel the abilities fully respect “the mathematical phenomena that are inherent in those challenges and situations where mathematical analysis can be used” (Denmark)
- Where are the levels of proficiency described for the abilities? (Mexico)

- The relationship between processes and abilities needs some further clarification(Ireland and United States); expand section to include all abilities in the framework with example items (Ireland)

Intra-mathematical items (Box para 87)

- Concern that an increase in the proportion of these items will undermine trends (Australia, France)
- Concern about risk of having too many items not related to any specific context (Mexico)
- Supports the continuation of the use of the term ‘Intra-mathematical’ (Australia, Denmark)
- Welcomes progress (Switzerland)
- ‘Intra-mathematical’ term is not clear (Korea)

Content category weightings (Box para 93)

- Weightings should be equally spread (Australia, France, Denmark)
- Should not differ much from earlier PISA rounds (Canada, Norway)
- Strong justification for diverging from PISA 2003 weights needed but assuming this can be provided, supports the proposal (Ireland)
- Supports giving “Uncertainty” less weight (Switzerland)
- The weightings should not be argued on the ground of the curriculum profile in countries (Belgium)

Competency category weighting (Box para 93)

- Support having items that span multiple categories – i.e. “Modelling with mathematics” (Denmark)
- “Modelling with mathematics” could be problematic and may therefore justify less emphasis (Switzerland)
- Supports the proposals (Austria)
- What does the weighting become if ‘Modelling with mathematics’ cannot be reported? (Mexico)

Context category weightings (Box para 95)

- Concern that a high proportion of items that are ‘intra-mathematical’ in the scientific context will undermine trends (France)
- Supports equal weighting to context categories as proposed (Australia, Austria, Canada, Germany, Norway, Switzerland).