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The Emergence of Alternative Credentials

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This Working Paper has been authorised by Andreas Schleicher, Director of the Directorate for Education and Skills, OECD.

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Abstract

The landscape of post-secondary education is changing with the emergence of new credentials that are engaging millions of learners. So-called "alternative credentials" – such as micro-credentials, digital badges and industry-recognised certificates – have expanded their scale considerably, as a consequence of a rising demand for upskilling and reskilling, as well as a sharp reduction in the unit cost of provision made possible by digitalisation. Higher education institutions, businesses and other institutions are actively offering alternative credentials that help learners acquire new skills, update their existing skills and signal the competencies they already have. Despite an increasing volume of these new credentials, great uncertainty persists. This working paper aims to assist policy makers across the OECD by defining terminologies, identifying the characteristics of these credentials, looking at providers and learners of these credentials, and examining how employers and governments perceive these credentials.

Résumé

Le paysage de l'enseignement supérieur a évolué avec l'émergence de nouveaux diplômes, qui mobilisent des millions d'apprenants. Ces « diplômes alternatifs » (tels que les micro-diplômes, les badges numériques et les certificats reconnus par l'industrie) ont pris une ampleur considérable, en raison de la demande croissante pour des formations de perfectionnement et de reconversion professionnelle, et de la diminution conséquente du coût unitaire de provision, rendue possible par la numérisation. Les établissements d'enseignement supérieur, les entreprises et les établissements tiers font preuve d'un grand dynamisme pour proposer des diplômes alternatifs qui aident les apprenants à actualiser leurs compétences, à certifier celles qu'ils possèdent déjà et à en acquérir de nouvelles. Bien que ces nouveaux diplômes augmentent en nombre, des doutes persistent à leur sujet. Ce document de travail vise à aider les décideurs politiques dans l'ensemble de l'OCDE, en définissant le vocabulaire relatif aux diplômes alternatifs, en identifiant les caractéristiques de ces diplômes, des institutions qui les proposent et des apprenants et en étudiant la façon dont les employeurs et les gouvernements perçoivent ces diplômes.

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1. Introduction

A rising share of the adult population in OECD member countries holds traditional higher education qualifications – such as bachelor's, master's or doctoral degrees. In spite of their growing frequency, these qualifications continue, on average, to deliver economic benefits for those who acquire them.

Nonetheless, in recent years, new ways of acquiring and signalling skills are emerging, and engaging millions of learners. So-called "alternative credentials" – such as micro-credentials, digital badges and industry-recognised certificates – have been touted as a means by which to fill a gap between the programmes that higher education institutions (HEIs) provide and the skills that firms seek; as a way of increasing the efficiency of higher education systems by offering more highly targeted training than traditional degree programmes; and as a force of innovation, permitting entirely new kinds of organisations to enter the higher education marketplace, and to create new ways for traditional HEIs to reach new learners across the world (Fain, 2018[1]; Strada Education Network; Gallup; Lumina Foundation, 2019[2]; The Chronicle of Higher Education, 2019[3]).

Despite an increasing volume of these new credentials, great uncertainty persists. Definitions and taxonomies to structure these new credentials have not been widely agreed. The extent of their offer remains uncertain, evidence of their impacts is scant, and the response of governments to these new offerings has not been systematically documented.

This working paper aims to assist policy makers across the OECD by examining developments in the field of practice, emerging research evidence, and government policies across the OECD. In the sections that follow, we examine:

- What are so-called "alternative credentials"? What are some of their principal characteristics?
- How is provision organised? Why do providers award these credentials?
- Who are learners? Why do they pursue these credentials?
- How do employers assess and reward these new credentials?
- How have governments responded to these new credentials?

In light of swift changes in practice and policy, and the emergence of new evidence about these credentials, this working paper marks a first instalment in a programme analysing and reporting these new credentials.

2. What are alternative credentials?

2.1. Definition and scope

The term "alternative credentials" is relatively recent, and has not yet developed a shared and common definition. It is a term first popularised in the United States to draw a contrast with credentials traditionally conferred by HEIs at the completion of study programmes – associate, bachelor's, master's and doctoral degrees.

This working paper defines the term "alternative credentials" as **credentials that are not recognised as standalone formal educational qualifications by relevant national education authorities.** While alternative credentials can be awarded at all levels of education, this paper focuses on alternative credentials geared towards individuals who have completed a secondary education. Our focus is on three conceptually distinct forms of alternative credentials offered at the post-secondary or tertiary education level (ISCED[1] Level 4-8): certificates, digital badges, and micro-credentials.

- **Certificates**: **Academic certificates** recognising completion of organised learning activity may be awarded by educational institutions. These may or may not confer academic credits applicable towards degree programmes. **Professional/industrial certificates** are awarded by professional bodies, industries or product vendors, typically following completion of an examination (Box 2.1).
- **Digital badges** are defined by SURFnet as "digital pictograms or logos that can be shared across web to show accomplishment of certain skills and knowledge" (SURFnet, 2016[4]). The skills or experience to which they attest are highly variable (from general to specialised skills and knowledge, and from cognitive to non-cognitive skills), and may or may not be related to an academic programme of study (as with academic certificates) or industry and professional standards (as with professional certificates).
- Some certificates and digital badges offered by a HEI or professional body are labelled as "**micro-credentials**". OECD countries have distinct formulations of this term, particularly in terms of the size of credentials.
  - Typically in the United States, micro-credentials are understood as learning activity consisting of "*more than a single course but less than a full degree*", and are labelled differently across providers, such as MicroMasters (edX), Nanodegree (Udacity) and Specialisation (Coursera) (Pickard, 2018[5]).
  - In the European Higher Education Area (EHEA), an emerging definition of micro-credentials is a "sub-unit of a credential or credentials that confer a minimum of 5 ECTS[2], and could accumulate into a larger credential or be part of a portfolio" (MicroHE Consortium, 2019[6]).
  - Oceania tends to adapt a wider definition, and both of the above-mentioned types of micro-credentials, ranging from 5-40 credits, are regarded as micro-credentials (New Zealand Qualifications Authority, 2019[7]).

[1] International Standard Classification of Education (ISCED).

[2] European Credit Transfer and Accumulation System (ECTS).

- Common to all of the usages of the term micro-credentials is the implication that there is a related credential of greater scope on offer (International Council for Open and Distance Education, 2019[8]).

There is overlap between these three types of credentials: micro-credentials are new ways of labelling certificates and digital badges; individuals may obtain both a certificate and digital badge simultaneously, after the completion of a learning programme.

Viewed within the ISCED framework (UNESCO Institute for Statistics, 2012[9]), some alternative credentials may be classified as part of a formal education programme; others as a non-formal education programme (or part of a non-formal education programme); and still others would be obtained through informal learning activity.

Box 2.1. Distinct terminologies in the United States

A "**certificate**" refers to two different types of credentials in the United States:

- a formal educational qualification awarded by a HEI, recognising completion of a **credit-bearing programme of study** at the post-secondary non-tertiary education (sub-baccalaureate) level (ISCED Level 4) (Sykes, 2012[10]).
- a document issued by an educational institution that recognises **completion of a learning activity that may not confer credits** (towards the award of an academic degree).

→ The first of these two credentials is a longstanding part of the higher education "product mix" in the United States, not a newly-devised "alternative credential" that changes the higher education delivery model, and is therefore outside the scope of our analysis.

The term "**certification**" is used to describe recognition of learning issued by a profession or industry body, permitting policy makers and stakeholders to distinguish between "certificates" awarded by HEIs recognising the completion of a credit-bearing study programme and "certifications" issued by professions and industries.

→ This paper follows the international nomenclature of "professional/industrial certificates" (since the professional/industrial modifier is clearly differentiated between them).

Apprenticeships, a form of work-based learning, are sometimes included within the scope of **alternative credentials** in policy discussion in the United States, as apprenticeships have historically been organised outside of the education system and are not recognised by national education authorities.

→ This paper does not include apprenticeships as alternative credentials, since apprenticeships in most OECD Member countries are typically recognised as formal educational programmes (OECD, 2018[11]).

Although the use of the term "alternative credentials" may be recent, some HEIs have long been offering academic certificates, typically hosted by continuing education schemes, extension services, or foundations (OECD, 2019[12]). Likewise, professional certificates are not entirely new. For example, the Project Management Institute's *Project Management Professional* (PMP) certificates, established in 1984, had approximately one million PMP-certified individuals in 2019.

Nonetheless, a strong demand for upskilling and reskilling – and possibly a sharp reduction in the unit cost of provision made possible by digitalisation – have transformed the scale

of these alternative credentials. In some OECD economies, these alternative credentials are beginning to provide an important path for the acquisition and signalling of skills, to change how HEIs organise their offer, to gain some currency among firms, and to enter the policy framework of national authorities.

2.2. Characteristics of alternative credentials

To assist policy makers and higher education stakeholders in understanding the implications of newly-developing alternative credentials, we focus on six characteristics of potential importance to learners, employers and policy makers: *delivery modes; duration; assessment processes; areas of focus; capacity to be embedded within or cumulate into larger credentials; and characteristics of providers*.

For learners, delivery modes determine the accessibility to learning opportunities (e.g. in case of face-to-face and blended learning, learner's participation is greatly affected by their physical location); duration of credentials indicates opportunity costs (and, often, though not always, higher outlays); assessment processes relate to quality and recognition by others, including employers; areas of focus determine relevance of credentials; capacity to be integrated into other credentials matters to their lifelong learning planning; and providers relate to quality and relevance of credentials.

For employers and policy makers, information on delivery modes, duration of credentials, and areas of focus helps them better understand one's learning experience, while assessment processes and providers are important factors in determining the quality of learning experience. Duration of credentials, assessment processes, areas of focus, capacity to be integrated into other credentials, and providers also matter when considering what recognition should be awarded to one's learning experience.

2.2.1. Delivery mode: face-to-face, online, and blended

The historical precursors to today's new alternative credential programmes were delivered through **face-to-face** instruction in a classroom environment, providing learners with direct instructor guidance and personal interaction with peers. In the case of HEIs, departments of continuing education or extension programmes would organise face-to-face instruction in their establishments, often on evening or weekend schedules. Governments, too, sometimes organise lifelong learning programmes in public buildings. In Paris, for example, the *Mairie* (city hall) organises French language instruction in support of social inclusion and citizenship, examining and credentialing learners through the Common European Framework of Reference for Languages (CEFR), an assessment framework widely used across Europe (Bureau des Cours Municipaux d'Adultes, 2019[13]). Even newly established micro-credential programmes may be delivered through face-to-face instruction – in cases where HEIs are based in a metropolitan area and have access to a local learner population that can support programmes at sufficient scale. The University at Buffalo, for example, offers a range of face-to-face micro-credential programmes ranging from one to three semesters in duration through its Office of Micro-Credentials, such as a one-semester programme on project-based collaboration and a three-semester programme on clinical pharmacy research (University at Buffalo, 2019[14]).

Alternative credential programmes appear typically to be delivered **online**, benefiting from the flexibility and wide reach allowed by this type of learning. The most common type of alternative credential programmes delivered online are massive open online courses (MOOCs). MOOCs are online distance courses that are free or low cost, and that can be accessed by all willing learners, often without entry requirements (OECD, 2016[15]). With more than 100 million learners registered in 11 000 courses delivered through online

learning platforms, distance-based learning has become the principal means by which instruction, assessment and credentialing are organised (Box 2.2).

Alternative credential programmes may often be organised using **blended (or hybrid) provision**, in which elements of face-to-face learning are combined with digitalised, distance provision. For example, the Wharton Business School at the University of Pennsylvania and the Talent Management Institute have a talent management programme in which 30 hours of self-paced, web-based learning are complemented by two periods of face-to-face instruction and group working (of five and four days, respectively) (Talent Management Institute, 2019[16]). Organising blended or hybrid provision appears to have a beneficial impact on learning outcomes (Paniagua and Istance, 2018[17]), though it raises costs for programme participants (with direct outlays and time), and for providers themselves (who cannot exploit economies of scale in face-to-face provision).

Box 2.2. Massive Open Online Courses (MOOCs) and learning platforms

MOOCs

MOOCs are courses designed to permit large (effectively, unlimited) numbers of learners from across the world access to structured learning opportunities online at low or no cost. The original idea of MOOCs was to be "open", in two ways: first, by allowing anyone to enrol in courses without paying fees; and second, to allow learning to proceed without the need to meet institutional or programme entry requirements.

Since the first MOOC emerged in the late 2000s, MOOCs have increased their presence rapidly. Class Central, a MOOC search engine, reported that in 2019, there were over 900 HEIs and nearly 500 firms and institutions offering more than 13 500 courses worldwide, often in co-operation with education technology companies and through online learning platforms, and over 110 million individuals signed up for MOOCs (Shah, 2019[18])[3].

While learners can still enrol in many MOOCs free of charge and obtain access to web-based learning materials, they are now typically required to pay a fee to sit an assessment and/or obtain the credential recognising their completion of the course.

Due to high MOOC start-up and maintenance costs, most HEIs do not see developing and offering MOOCs as a way to improve cost efficiency of their institution's education provision (OECD, 2016[15]). The development of MOOCs requires not only the development of course content, but also the creation of online learning materials; a professor typically spent over 100 hours on his/her MOOC recording online lecture videos, among other preparation (Kolowich, 2013[19]). However, in the case of several HEIs, an increase in the provision of fee-based MOOCs appears to actively raise revenues (Shah, 2019[20]).

Learning platforms and MOOC hosting

While it is possible, in principle, for an individual HEI to offer a MOOC, there are substantial economies of scale that arise from creating a shared platform for MOOC hosting. Major learning platforms, such as Coursera, edX and Udacity, were developed in 2012, and at least 35 learning platforms were identified across the world in 2019 (Shah and Pickard, 2019[21]). The top five learning platforms by registered users were

[3] Data on China are excluded.

Coursera (United States), edX (United States), Udacity (United States), FutureLearn (United Kingdom) and SWAYAM (India) in 2019 (Shah, 2019[18])[3].

While some learning platforms (including Coursera and edX) host MOOCs developed by HEIs and businesses, and award credentials under the name of a content provider, others (such as LinkedIn Learning and Udacity) hire instructors and award credentials under their brands. Some of these operate as businesses (such as Coursera and Udacity), whereas others are owned by governments [e.g. SWAYAM (India)]. Others were founded by HEIs and operate as non-profit organisations (including edX and Futurelearn).

The evolution of platform-hosting and MOOCs – alternative credentials plus degrees

Initially, MOOCs were developed as learning instruments that could lead to alternative credentials. The most common types of MOOCs provide certificates to learners. MOOCs have also adapted to new types of alternative credentials, i.e. micro-credentials and digital badges. EdX first launched MOOC-based micro-credentials in 2013, called the XSeries. Coursera and Udacity also started their MOOC-based micro-credentials in 2014 (Specialization and Nanodegree, respectively) (Pickard, 2018[5]). In addition, the University of Notre Dame, for example, launched MOOC-based digital badge programmes on edX in 2015 (Ambrose, Anthony and Clark, 2016[22]).

However, in recent years, MOOCs are also being used as learning instruments that leads to degrees. Some HEIs are now offering full degree programmes through MOOCs (MOOC-based degree programmes). For example, Coursera hosts an online master of business administration (iMBA) programme developed by the University of Illinois at Urbana-Champaign at around USD 21 000. Class Central reported that the number of MOOC-based (full) degree programmes increased from 15 in 2017 to 50 in 2019 (Shah, 2019[18])[3].

2.2.2. Duration and pacing: from hours to months, with frequent self-pacing

The duration of an alternative credential programme is often shorter than that of a formal higher education programme that leads to the award of a degree. Professional certificates awarded on the basis of an assessment of competencies may require only hours of time, while others may require organised learning activity over several months. This variation in duration reflects the dual functions of alternative credentials, which is to permit learners to **cultivate or acquire** (and subsequently signal) new skills, and to **signal** the competencies that learners already possess to prospective employers.

Among alternative credentials that aim to **cultivate or acquire** skills, one finds instructional programmes that range from a few hours to a few months. A study on 290 MOOCs provided by Harvard University and Massachusetts Institute of Technology shows that the majority of certificate earners spent less than 50 hours online. The median of the time they spent online to obtain a certificate was 29 hours (Chuang and Ho, 2016[23]). According to the European MOOC Consortium Common Microcredential Framework, the total study time of a MOOC, including self-study time, should be no less than 100 hours and no more than 150 hours (4-6 ECTS) (European MOOC Consortium, 2019[24]). Class Central also reviewed over 450 MOOC-based micro-credential programmes, reporting that these programmes require around 6 months on average (from 3 to 12 months) to complete (Pickard, 2018[5]).

The assessment firm CLA+ offers a badge to higher education students who take its CLA+ assessment. In this instance, students take a 1.5 hour computer-based, monitored test, the score of which yields a digital badge **attesting** to three levels of competency in critical thinking skills: proficient, accomplished, or advanced. The badge can then subsequently be displayed via ProExam's online vault, in an electronic résumé, or in a LinkedIn profile. For HEIs and CLA+, the badge provides an incentive for students to take the examination and to invest their effort, while for learners the badge is alleged to "allow career ready students to stand out among their peers and appeal to companies seeking these higher order skills" (Council for Aid to Education, 2019[25]).

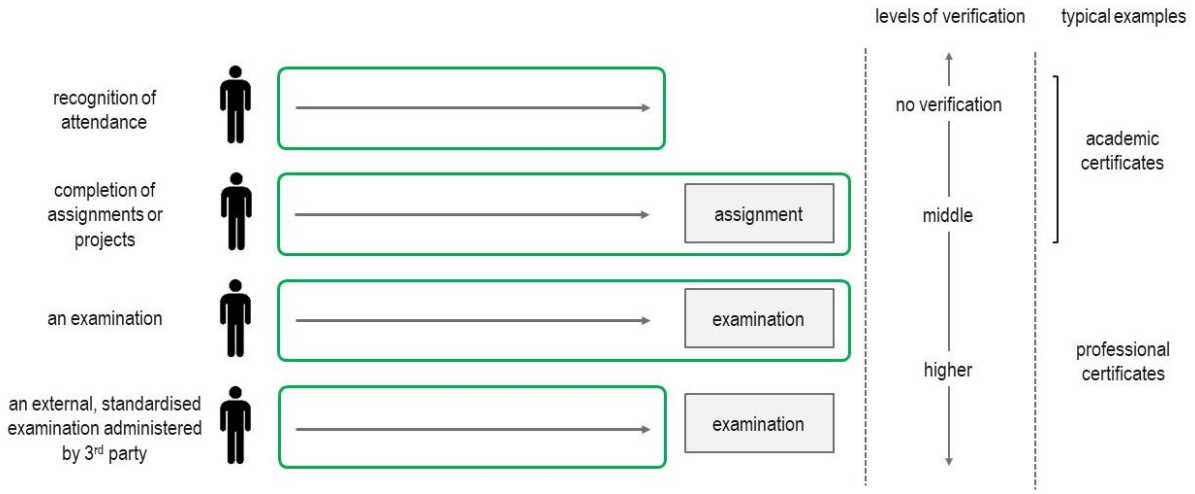
Credential pacing varies as well. While some alternative credential programmes have a defined timetable, enabling cohort-based learning, many others allow leaners to start anytime they wish, providing flexibility. Among those flexible options, some have a time limit in which learners can access learning opportunities and materials, while others do not.

2.2.3. Validation processes: attendance, assignments and/or examinations

The validation of learning that underpins certificates, badges, micro-credentials and other "alternative credentials" can vary widely. Alternative credentials may be awarded as a result of the completion of a learning experience (i.e. based on attendance and/or assignments), a pass of an examination or a combination of both (Figure 2.1).

Figure 2.1. Different types of validation processes

One's skills and/or knowledge developed in alternative credential programmes may be certified through



Some credentials are issued based on **attendance**. In some countries, such as Denmark, institutions called *Folkehøjskole* (folk high schools) provide non-formal adult education. Their students do not take examinations, but receive a certificate as a proof of their attendance (The Association of Folk High Schools in Denmark, 2019[26]).

Other credentials are awarded as a result of a series of **assignments (formative and/or summative)**. For example, the Saïd Business School at the University of Oxford, in collaboration with an education technology company 2U, Inc., offers some alternative credential programmes in new technology areas, such as artificial intelligence and blockchain technology. Participants of these programmes obtain an academic certificate by meeting several requirements, including the completion of a series of local (institutional) assignments delivered online (Saïd Business School, 2019[27]).

Alternative credentials that are based upon demonstrations of knowledge or competency rely on **assessments** that require learners to complete performance tasks, or to demonstrate mastery in a controlled testing setting. For example, an American non-profit organisation, the Project Management Institute, offers an alternative credential called the "Project Management Professional" (PMP). In order to gain the PMP, individuals need to meet several requirements, including having 4 500 to 7 500 hours of practical experience, completing 35 hours of institutionalised learning activities, and passing an examination consisting of 200 multiple-choice questions.

In many cases, training and preparation will be delivered by one entity, while the development and administration of an assessment rest with others. For example, many learners follow learning programmes that help them prepare for English language examinations, such as the International English Language Testing System (IELTS) and the Test of English as a Foreign Language (TOEFL). These test preparation programmes can be offered by several entities, including HEIs, languages schools and governmental bodies (e.g. the British Council), and can also be offered through learning platforms (e.g. Coursera). Individuals may also take courses in preparation for an examination of professional certificates, such as IT software certificates (e.g. Adobe and Microsoft) and project management certificates (e.g. PRINCE2), and then subsequently take examinations in testing centres or through online proctoring (i.e. being monitored by a proctor via webcam and microphone).

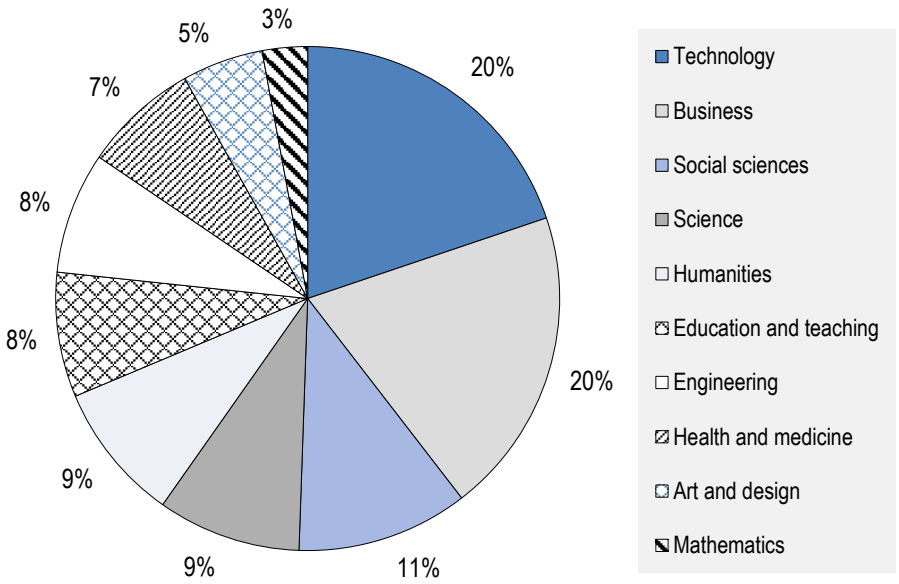
Alternative credentials that are awarded as a result of the **completion of learning experience** (i.e. based on attendance and/or locally marked assignments), appear to be valid for a lifetime. Credentials obtained through **a pass of an examination** that aims to validate competence or skills may be effective only for a few years, and learners may need to renew their credentials by retaking an examination or meeting certain requirements. According the United States Adult Training and Education Survey, over 40% of the respondents who held a professional certificate reported that their certificate can be revoked or suspended (Cronen et al., 2018[28]).

2.2.4. Content and areas of focus: from general to specialised skills and knowledge, and from cognitive to non-cognitive skills

Alternative credential programmes frequently focus on a range of skills or knowledge that are highly relevant to the labour market. Some aim to develop general skills that are widely applicable, (e.g. language skills); others skills of intermediate generality (e.g. knowledge of software, or project management skills) and still others highly specific knowledge or competencies (e.g. a different set of skills required for school teachers). While some alternative credentials focus on cognitive skills, others help learners develop non-cognitive skills (e.g. resilience). Alternative credential programmes on meta-cognitive skills are also widespread (e.g. learning about learning).

According to Class Central, technology and business accounted for around 20% of MOOC provision respectively in 2019. Approximately 10% of MOOCs were categorised in social sciences, science, and humanities, respectively (Figure 2.2).

Figure 2.2. MOOC distribution by subject (2019)



Source: Shah (2019[29]), By The Numbers: MOOCs in 2019, www.classcentral.com/report/mooc-stats-2019/ (accessed on 2 January 2020).

Table 2.1 shows MOOCs that had the largest enrolment in 2019 on two large learning platforms, Coursera and edX, demonstrating the range of topics that can be covered by MOOCs. Courses focusing on general cognitive skills include '*English for Career Development*' by the University of Pennsylvania and '*Introduction to Data Analysis using Excel*' by Microsoft. Courses with a scope on specific cognitive skills include '*Machine Learning*' by Stanford University, and '*CS50's Introduction to Computer Science*' by Harvard University. '*Learning How to Learn: Powerful Mental Tools to Help You Master Tough Subjects*' by the University of California, San Diego, could be an example of a course focusing on the development of general non-cognitive skills.

Table 2.1. MOOCs with the largest enrolment on two large learning platforms (2019)

Among courses provided on Coursera and edX

Coursera	
Machine Learning	Stanford University
Learning How to Learn: Powerful Mental Tools to Help You Master Tough Subjects	The University of California, San Diego
The Science of Well-Being	Yale University
Programming for Everybody (Getting Started with Python)	University of Michigan
AI for Everyone	deeplearning.ai
Neural Networks and Deep Learning	deeplearning.ai
English for Career Development	The University of Pennsylvania
Algorithms, Part I	Princeton University
Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning	deeplearning.ai
What Is Data Science?	IBM
edX	
CS50's Introduction to Computer Science	Harvard University
IELTS Academic Test Preparation	University of Queensland
Introduction to Computer Science and Programming Using Python	Massachusetts Institute of Technology
Introduction to Python: Absolute Beginner	Microsoft
Introduction to Data Analysis using Excel	Microsoft
TOEFL® Test Preparation: The Insider's Guide	ETS
Data Science: R Basics	Harvard University
Analysing and Visualizing Data with Power BI	Microsoft
Python for Data Science	The University of California, San Diego
Introduction to Linux	Linux Foundation

Source: Shah (2019[30]), Coursera's 2019: Year in Review, www.classcentral.com/report/coursera-2019-year-review/ (accessed on 2 January 2020); Shah (2019[31]), Edx's 2019: Year In Review, www.classcentral.com/report/edx-2019-year-review/ (accessed on 2 January 2020).

In addition, Burning Glass Technologies examined 16 million job postings in the United States in 2015 and identified the top five professional certificates based on employer demand (i.e. the number of requests) (Table 2.2). Similar to MOOC provision, technology (e.g. the Certified Information Systems Security Professional, CISSP) and business (e.g. the Certified Public Accountant certificate[4], CPA) are the two most popular areas for these certificates.

Table 2.2. Professional certificates in the United States, by employers' demand (2015)

Top 5 Professional Certificates	Number of Requests
Certified Public Accountant (CPA)	276 880
Project Management Certification (PMP)	202 971
Certified Information Systems Security Professional (CISSP)	91 981
Automotive Service Excellence Certificate (ASE)	67 973
Cisco Certified Network Associate (CCNA)	67 746

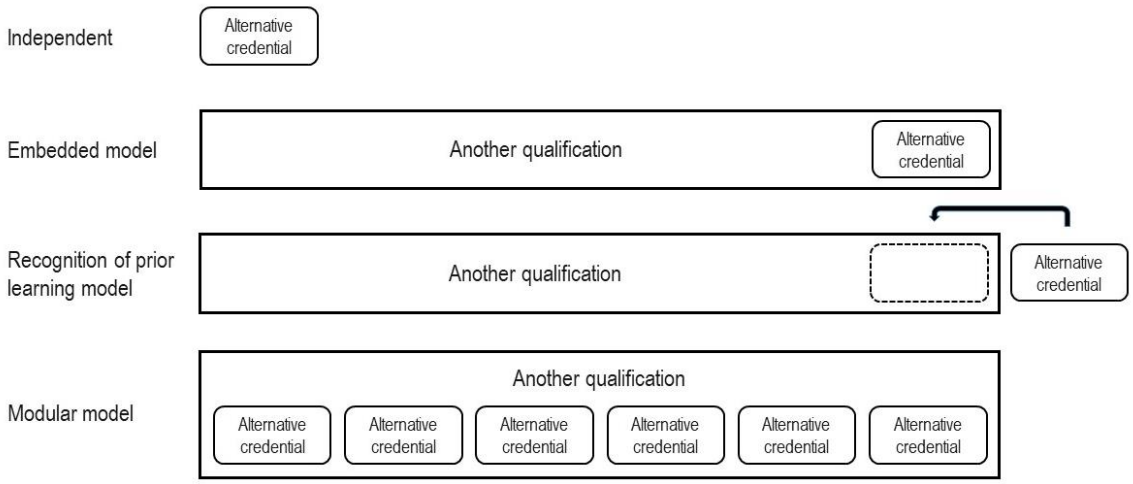
Source: Burning Glass Technologies (2017[32]), The Narrow Ladder: The Value of Industry Certifications in the Job Market.

[4] The CPA certificate is an acknowledgement that an individual meets all the requirements to take the Uniform Certified Public Accountant Examination and passes the exam. It is differentiated from the CPA license that can be issued by fulfilling all the requirements from a board of accountancy to become a CPA (Boyd, 2019[67]).

2.2.5. Integration options: independent or integrated

Alternative credentials may be offered entirely **independently** or be **integrated** into another qualification, including a formal higher education qualification. There are three models of integration: an embedded model, a recognition of prior learning model and a modular model (Figure 2.3).

Figure 2.3. Integration of alternative credentials to another qualification programme



In the case of **the embedded model**, alternative credentials may be **integrated *ex ante* by design into** another qualification programme, with course content and assessments for the alternative credentials used in lieu of locally developed content and assessments. According to a study conducted by the Corporation for a Skilled Workforce and the Lumina Foundation, professional certificates across more than 16 industry sectors, such as health care, IT and manufacturing, have been embedded into study programmes offered by HEIs in the United States (Zanville, Porter and Ganzglass, 2017[33]). A Pearson VUE survey also shows that one-quarter of the respondents with at least one IT certificate pursued their certificate as a result of an academic programme or course in which they were enrolled (Pearson VUE, 2019[34]).

Alternatively, qualification awarding bodies may take alternative credentials into account *ex post* in **the recognition of prior learning** (and academic credits) into another qualification programmes. For example, Kiron, a German NGO, offers a study programme based on MOOCs to refugees, and students can receive a maximum of 60 ECTS credits (equivalent to a workload of one full-time study year) in case they enrol in Kiron's partner universities (Suter and Rampelt, 2017[35]). The Google IT Support Professional Certificate programme is also accepted as prior learning credits for bachelor's degree programmes offered by several HEIs, including the University of London and Northeastern University.

In the case of the embedded model, learners are required to complete alternative credential programmes as part of the curriculum of another qualification programme, therefore often participating in alternative credential programmes after enrolling in another qualification programme. In the recognition of prior learning model, on the other hand, learners are free to decide whether they apply for recognition of prior learning, and often complete alternative credential programmes prior to enrolment in another qualification programme.

In other cases, learners can take alternative credentials as **modules** (which can also be independent credentials), and after completing several alternative credentials, receive another qualification. For example, some HEIs split part of a master's degree programme into modules, and offer modules through learning platforms (e.g. MasterTrack Certificates from Coursera and MicroMasters from edX).

Some higher education systems in which study programmes were delivered as a fully integrated learning experience have begun to modularise their curriculum. For example, in the Flemish Community of Belgium, all HEIs must provide their programmes in the form of flexible pathways, meaning that students can enrol for a full degree programme, for a module (course), or just to take an exam. HEIs validate the completion of a module by issuing a credit certificate. (OECD, 2019[12]). Similarly, in the Netherlands, there is a pilot project attempting to allow learners to take modules, without enrolling in full higher education programmes. Learners receive certificates for smaller learning units, which are not recognised as formal educational qualifications (SURFnet, 2016[4]).

2.2.6. Similarities and differences among credentials

Certificates, digital badges and micro-credentials have some similarities and differences. Learning that leads to these credentials can be delivered face-to-face, online, or blended; although micro-credentials, as defined in North American systems, are primarily offered online (through learning platforms) (Pickard, 2018[5]). Similarly, there is no definite duration of alternative credential programmes; the workload that leads to these credentials can range from a few hours to months. In terms of assessment processes, alternative credentials that are offered by educational institutions tend to be awarded based on attendance and/or assignments (e.g. academic certificates and micro-credentials), while those granted by professional bodies are likely to be validated by examinations (e.g. professional certificates). Areas of focus are similar among these credentials, although professional certificates and micro-credentials tend to focus on topics that are highly relevant to the labour market. In addition, one feature of a micro-credential as defined in Europe is its capacity to be integrated to another credential (MicroHE Consortium, 2019[6]); certificates and digital badges can be either independent or a part of another credential.

Digital badges appear to have more variety in provision than other credentials. Digital badges may represent completion of learning activity or a pass of proctored examination(s) (like other alternative credentials), and may also acknowledge experiences and skills that are not shown on academic transcripts or CVs, including exercise of interpersonal skills and participation in extracurricular or volunteer activities (EDUCAUSE, 2019[36]).

3. How is provision organised?

3.1. Main content providers

While formal higher education programmes are provided by public organisations and recognised private bodies, alternative credentials are provided often in collaboration across different types of organisations, including HEIs, businesses and non-governmental organisations.

According to Class Central, a MOOCs search engine, there were over 900 **HEIs** offering MOOCs in 2019 across the world. Some HEIs, including Massachusetts Institute of Technology, University of Michigan, Stanford University, Indian Institute of Technology Kharagpur, and University of Naples Federico II, each offer more than 150 courses (Shah, 2019[18])[3].

Traditionally, their alternative credential programmes are organised by departments of continuing education or associated bodies, such as extensions and foundations. However, in the case of online courses, including MOOCs, HEIs often develop courses with education technology companies, and offer courses in partnership with learning platforms (Coursera, edX, FutureLearn, Udacity, XuetangX etc.) (Box 3.1). A study of 190 US HEIs reported that around two-thirds of institutions award alternative credentials in partnership with other bodies, including professional associations (29%), education technology companies (24%), and online learning platforms (10%) (Fong, Janzow and Peck, 2016[37]).

Some specialised learning platforms also exist, focused on particular occupations or professions. In the education sector, for example, alternative credential programmes are increasingly used as a tool of continuing professional development and career advancement, and online learning platforms, such as BloomBoard and Teaching Matters, in partnership with states, districts and schools, offer these programmes to school teachers.

Most large **companies** have long been offering in-house training programmes. Some of these lead to alternative credentials (mostly professional certificates): for example, employees of McDonald's may be able to take training courses focusing on operational skills, leadership skills and business skills at Hamburger University campuses across the world, and receive certificates noting the completion of courses.

Large firms, particularly technology firms, have also been providing training programmes and examinations to a wider public for many years. Amazon, Cisco, Google, IBM, Microsoft and other technology companies are actively providing alternative credential programmes focusing on information technology, particularly in emerging technology areas, including artificial intelligence and cybersecurity (Fain, 2018[1]). For example, Microsoft awards both professional certificates and digital badges to individuals who successfully pass their examinations (Microsoft, 2019[38]).

Human resource and recruitment companies are also entering this market, as are specialised social media platforms. For example, Adecco, a staffing firm, acquired General Assembly, a digital skills training provider, in 2018, aiming to better match skills demand and supply. LinkedIn, a professional network service owned by Microsoft, is also joining the alternative credentials market. LinkedIn acquired Lynda.com, an online course provider, in 2015, aiming to provide a more personalised learning experience to nearly 600 million LinkedIn users. Additionally, in 2019, the launch of a skills assessment tool was announced, which validates LinkedIn users' skills and knowledge by issuing digital badges, creating an integrated suite of products – training, assessment, and badging, then dissemination on their platform.

Box 3.1. Developing online courses

While some providers develop and deliver online courses by themselves, others do so in collaboration with learning platforms and education technology companies. However, as shown in Table 3.1, the role of learning platforms and education technology companies primarily relies on course delivery (i.e. using their learning systems to deliver courses). Learning platforms and education technology companies may help providers develop and improve course content by sharing employer demand and learner feedback.

The creation of online learning material involves several non-teaching activities, including recording, editing, processing and publishing video materials. HarvardX, Harvard University's online course initiative, for example, has over 40 staff, including videographers, graphic designers, digital editors, a copyright attorney and an accessibility co-ordinator (who makes materials accessible to sight- and hearing-impaired learners) (Shaw, 2017[39]). Harvard University also runs online courses in partnership with education technology companies, such as 2U, Inc., outsourcing some work such as the creation of learning material and course delivery.

Table 3.1. Different ways of developing online courses

Typical responsibilities of the different parties involved in the course provision process

	A provider on its own	With a learning platform	With an education technology company
Develop content	provider	provider	provider
Create learning material	provider	provider	education technology company
Deliver courses	provider	learning platform	education technology company
Provide learning support	provider	provider	provider
Assess learning	provider	provider	provider
Award credentials	provider	provider	provider
Collect learners feedback	provider	provider/learning platform	education technology company
Examples	HarvardX (Harvard University)	Google IT Support Professional Certificate (Google and Coursera)	Harvard University FinTech online short course (Harvard University and 2U, Inc.)

In addition to HEIs and companies, **other institutions**, including the British Council, the International Labour Organization, and the World Bank, provide alternative credentials, often in the form of certificates, to learners across the world. According to Open Badges (2019[40]), currently, badges in accordance with their specifications are issued by over 3 000 organisations across the world, including schools and universities, businesses, non-profit organisations (e.g. YMCA), government agencies (e.g. NASA and the New York City Department of Education), and libraries and museums.

Content providers across different sectors also collaborate in offering alternative credentials. For example, the Institute of Coding, a GBP 40 million initiative funded by the UK Department for Education, brings 33 HEIs, 81 employers (from SMEs to large

companies such as Cisco, J. P. Morgan and Shell) and 20 outreach partners across England and Wales together to develop and offer alternative credentials on digital skills (Institute of Coding, 2019[41]).

3.2. Content providers' motivation and benefits

It appears that these organisations have different motivations to enter this market. **HEIs** offer alternative credentials for several reasons, including increasing their visibility and reputation, experimenting with new pedagogies and technologies, generating additional income or reducing costs, as well as increasing their responsiveness to leaners' and labour markets' demands (Jansen and Schuwer, 2015[42]).

HEIs use alternative credentials as a tool to increase their visibility and build their brand. In other words, HEIs hope that these learners may enrol in their formal education programmes in the future. They also aim to attract more diverse groups of individuals by offering alternative credential programmes, which often have greater flexibility and cost less compared to formal higher education programmes.

In addition, HEIs offer alternative credentials, particularly those offered online, to encourage innovation in education. By experimenting with new pedagogies and technologies in the form of alternative credentials, they hope to improve the quality of their formal education offering and promote the transition to more flexible and distance-enabled (online) education (UNESCO and Commonwealth of Learning, 2016[43]). Other possible motivations include increasing labour market relevance, promoting research in this area by collecting big data, earning income and keeping contact with alumni.

Surveys of HEIs in Europe and the United States show that one-quarter of respondents reported that increasing the visibility of institutions is a primary objective of offering MOOCs (Allen and Seaman, 2015[44]; Jansen and Schuwer, 2015[42]). HEIs in both Europe and the United States also offer MOOCs in order to provide flexible learning opportunities and explore innovative pedagogy (around 15% of the respondents). While European institutions also aim to reach new students through the provision of MOOCs, American institutions hope to drive student recruitment. Less than 1% of survey respondents in Europe, and 5% in the United States, chose generating income as their primary objective. Indeed, while the development and maintenance of MOOCs require HEIs to provide large resource investment, most of them are still offered at low or no cost.

Another study of 190 US HEIs reports that over 60% of the respondents agree that they see alternative credentials as an important strategy for their future, more than half agree that they see them as a supplementary source of income, and nearly 40% think of them as an important evolving opportunity to better serve their constituencies (Fong, Janzow and Peck, 2016[37]).

Whether HEIs offer alternative credentials to generate income or reduce costs appears to depend on the types of programmes. When HEIs develop and offer traditional MOOCs (i.e. allowing learners to take courses for free and providing certificates for no or low cost), they tend not to think of financial benefits, as reflected in the study conducted in 2014, when fee-based MOOCs were less prevalent (Allen and Seaman, 2015[44]; Jansen and Schuwer, 2015[42]). However, when HEIs provide fee-based alternative credentials, there seem to be some financial drivers for them to provide these programmes, as shown by the study of Fong, Janzow and Peck (2016[37]). The Wharton School of the University of Pennsylvania, for example, made USD 20 million with their MOOC-based micro-credentials offered through Coursera (Burke, 2019[45]).

Other education providers, both enterprises and non-governmental organisations, view the expansion of alternative credentials as an opportunity to enlarge their businesses and activities. As discussed, **employers** are also actively entering the alternative credentials market. They may be considering the expansion as an opportunity to increase their influence on education and supply of labour, and essentially to improve labour productivity. In the case of formal education programmes, employers' participation in education can be limited – they may give advice on the government or HEIs or may develop some programmes in co-operation with HEIs. However, in the case of alternative credential programmes, they can choose learning methods and outcomes more freely and train individuals in the way they wish.

4. Who seeks out alternative credentials, and why?

4.1. Learner profiles

Initial efforts to collect data on alternative credentials are commencing. For example, the United States Adult Training and Education Survey in 2016 included professional certificates in its scope, along with formal education credentials (Cronen et al., 2018[28]). However, comprehensive public data on the provision of alternative credentials are not yet available. National labour force surveys identify years of schooling or levels of educational attainment among survey respondents, but do not contain information about alternative credentials. Administrative data collected by national authorities likewise focus on traditional academic awards conferred by HEIs. Information about participation in the new learning opportunities rests with the providers themselves, among whom large-scale learning platforms appear to offer the most extensive evidence about participants. This section examines survey data on non-formal education and training and MOOCs among adults, recognising that data on non-formal education and training provide an imperfect proxy for participation in learning leading to alternative credentials.

Some data on participation in non-formal education and training are available from large-scale international surveys, such as the Survey of Adult Skills (PIAAC), a representative survey of the adult population in over 40 countries and economies. The PIAAC data show that organised learning in adulthood is most often undertaken by those who have completed higher education, and with higher levels of skills. Among 25-65 year-olds, adults with higher education are 31 percentage points more likely to participate in non-formal education and training than those without higher education (67% vs 36%). Similarly, adults who demonstrated higher literacy skills in PIAAC (i.e. those who reached level 3 or above of the literacy proficiency scale[5]) are 26 percentage points more likely to participate in non-formal education and training than those with lower literacy skills (61% vs 35%). Adults who are in prime working age (25-54), men, and employed, earn the median and higher wage, and work for larger firms tend to participate in non-formal education and training more than their counterparts (Figure 4.1).

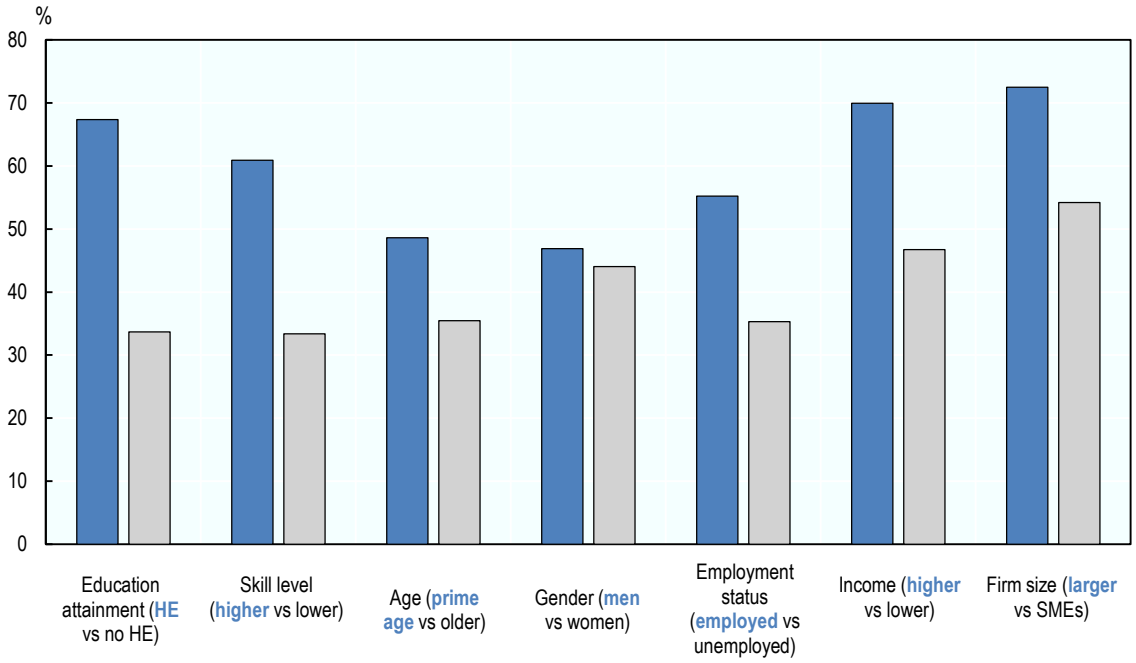
MOOC participants, like adults who report participating in non-formal education and training, tend to be relatively well-educated, male, and within the core-working age group (25-54). A survey of 2.4 million individuals participated in MOOCs developed by Harvard University and Massachusetts Institute of Technology and offered on edX reported that over 70% of the participants held a bachelor's degree. Around two-thirds of the participants were men, and the median age of the participants was 29 (Chuang and Ho, 2016[23]). Another survey of 52 000 individuals who had completed at least one MOOC offered on Coursera reported that, over 80% held at least a bachelor's degree – one-third had a bachelor's degree, another one-third held a master's degree and around 10% had a doctorate degree (Zhenghao et al., 2015[46]). In addition, a recent survey on 262 individuals who completed two types of MOOC-based micro-credentials [i.e. MicroMasters (edX) and Specialisation (Coursera)] reported that 85% of the completers held an undergraduate or graduate degree; over half were male; and the average age of the respondents was 36. Base

[5] Adults performing at level 3 in the literacy proficiency scale can understand and respond appropriately to dense or lengthy texts. They understand text structures and rhetorical devices and can identify, interpret, or evaluate one or more pieces of information and make appropriate inferences. They can also perform multistep operations and select relevant data from competing information in order to identify and formulate responses (OECD, 2019[48]).

annual salary of the completers ranged between zero to USD 500 000, with a median of USD 50 000 (Hollands and Kazi, 2019[47]).

Figure 4.1. Percentages of adults participating in non-formal education and training in OECD countries and economies, by individuals characteristics (2012, 2015 or 2018)

25-65 year-olds



Notes: Data refer to OECD countries and economies that participated in PIAAC, namely Australia, Austria, Belgium (Flanders), Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Korea, Lithuania, Mexico, the Netherlands, New Zealand, Norway, Poland, Slovak Republic, Slovenia, Spain, Sweden, Turkey, the United Kingdom (England and Northern Ireland) and the United States. Each country or economy participated in one (or two) of the three rounds of PIAAC in 2012,2015 or 2018.
Skills level: individuals who reach level 3 or above of the literacy proficiency scale are labelled as ones with "higher" skills[5], while those scored level 2 or below are categorised as ones with "lower" skills.
Age: 25-54 year-olds are categorised as "prime age".
Income: individuals who earn the median and higher wage are labelled as ones with "higher" incomes.
Firm size: firms with over 250 employees are categorised as "larger", while those with 250 or less are labelled as "SMEs".
Source: OECD (2019[48]), Survey of Adult Skills (PIAAC), www.oecd.org/skills/piaac/ (accessed on 20 December 2019).

Some MOOCs may also display a strong regional skew, due to differences in learning cultures, labour market conditions, and language. One study of Coursera MOOCs found that 40% of completers were based in North America, over 30% in Europe, around 10% in Asia and Latin America, and 3% in Africa and Oceania (Zhenghao et al., 2015[46]). According to the above-mentioned study on two types of MOOC-based micro-credentials, nearly one-third of the completers were based in the United States, 8% in India and 5% in Canada (Hollands and Kazi, 2019[47]). Although MOOCs are available in more than 23 languages, around three-quarters of courses are offered in English (Class Central, 2019[49]).

The available data show that these new credentials do not yet serve as an "alternative" for individuals who are underrepresented in traditional higher education programmes. However, some programmes have been successful at attracting non-traditional learners. For example, over half of learners pursuing the Google IT Support Professional Certificate do not have a bachelor's degree (Burke, 2019[50]). This certificate programme, which takes approximately eight to twelve months to complete, costs USD 49 per month; and Google funds 10 000 scholarships for veterans, refugees and students from low-income backgrounds. Certificate holders can share their information with a consortium of over 20 employers, including Google and Walmart (Fain, 2018[1]).

4.2. Learners' motivation and benefits

Learners undertaking alternative credentials have different motivations. It appears that the **acquisition** and **verification** of skills and/or knowledge are the two main motivations for learners. Acquisition may be further broken down into upskilling (acquiring new skills) and reskilling (retraining). A Pearson VUE survey of over 10 000 individuals across the world who earned an IT certificate reported that approximately three-quarters of the respondents pursued a certificate on their own, while one-quarter earned it as part of an academic programme in which they were enrolled (Pearson VUE, 2019[34]). Among those who pursued a certificate on their own, one-third reported that they earned a certificate to increase knowledge of a certain technology or technical area (i.e. acquisition) and to improve professional profile or standing (i.e. verification), respectively.

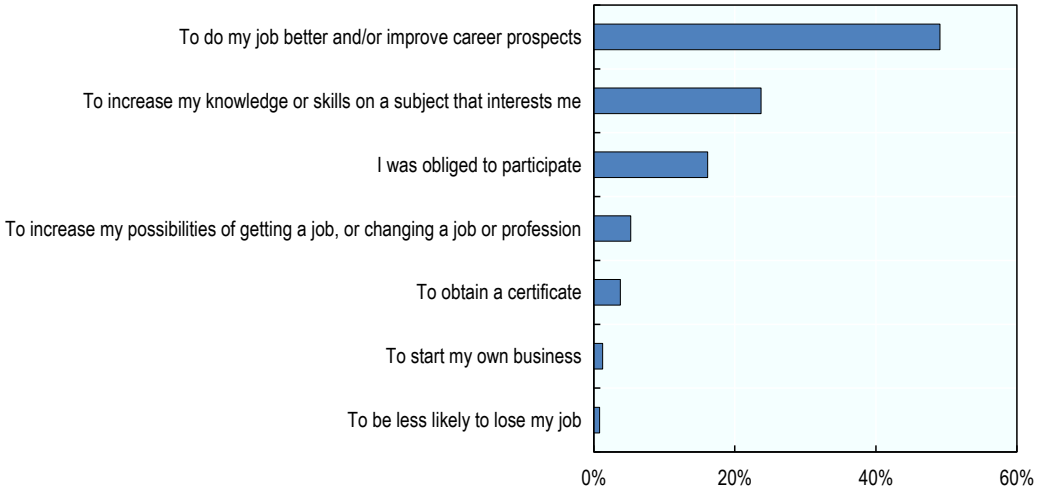
In addition, it is evident that most learners pursue alternative credentials for **work-related** purposes. Although data on participation in non-formal education and training do not necessarily represent participation in learning leading to alternative credentials, since data include learning that does not award credentials, such as mandatory training provided by employers, they can be a proxy. Across OECD countries and economies that participated in the OECD Survey of Adult Skills, around 70% of 25-65 year-olds who participated in non-formal education and training took part in job-related programmes (OECD, 2019[48]). More specifically, approximately half participated to improve their job performance and/or career prospects (Figure 4.2).

It also appears that learners are likely to find non-formal education and training relevant to their job or business. According to the OECD Survey of Adult Skills, approximately 80% of employed 25-65 year-olds who participated in non-formal education and training activities in a given year reported that these activities were very or moderately useful for the job or business, compared to around 70% of adults who participated in formal education and training activities (Figure 4.3). Only 6% regarded non-formal education and training as not useful at all, while 17% found formal education and training not useful at all.

The United States Adult Training and Education Survey also shows that 78% of the employed respondents with a professional certificate reported that their credentials were related to their current job. The survey also illustrates that the majority of the respondents with a professional certificate reported that their certificate was somewhat or very useful for keeping them marketable to employers or clients (90%), getting a job (86%), improving their work skills (86%) or keeping a job (83%) (Cronen et al., 2018[28]).

Figure 4.2. Reasons for participating in non-formal education and training in OECD countries and economies (2012, 2015 or 2018)

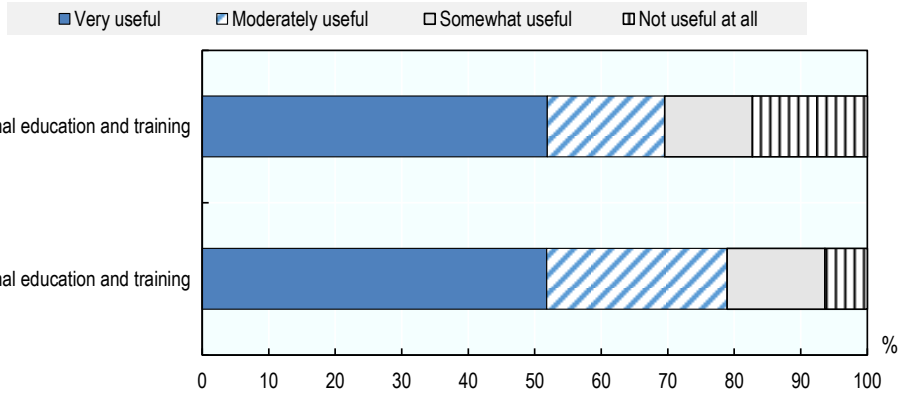
25-65 year-olds



Note: Data refer to OECD countries and economies that participated in PIAAC, namely Australia, Austria, Belgium (Flanders), Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Korea, Lithuania, Mexico, the Netherlands, New Zealand, Norway, Poland, Slovak Republic, Slovenia, Spain, Sweden, Turkey, the United Kingdom (England and Northern Ireland) and the United States. Each country or economy participated in one (or two) of the three rounds of PIAAC in 2012,2015 or 2018.
Source: OECD (2019[48]), Survey of Adult Skills (PIAAC), www.oecd.org/skills/piaac/ (accessed on 20 December 2019).

Figure 4.3. Usefulness of formal and non-formal education and training (2012, 2015 and 2018)

25-65 year-olds



Note: Data refer to OECD countries and economies that participated in PIAAC, namely Australia, Austria, Belgium (Flanders), Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Korea, Lithuania, Mexico, the Netherlands, New Zealand, Norway, Poland, Slovak Republic, Slovenia, Spain, Sweden, Turkey, the United Kingdom (England and Northern Ireland) and the United States. Each country or economy participated in one (or two) of the three rounds of PIAAC in 2012,2015 or 2018.
Source: OECD (2019[48]), Survey of Adult Skills (PIAAC), www.oecd.org/skills/piaac/ (accessed on 20 December 2019).

Moreover, some evidence shows that alternative credentials provide learners with different types of outcomes, both tangible and intangible. The Pearson VUE study shows that the IT certificate holders report three types of benefits, namely **extrinsic** (e.g. salary increase), **intrinsic** (e.g. greater self-confidence in abilities) and **practical** (e.g. knowledge has been transferable to real work situations), and they are more likely to report intrinsic and practical benefits than extrinsic ones (Pearson VUE, 2019[34]). Similarly, another study on Coursera MOOCs reports that course completers were more likely to achieve intangible career benefits (e.g. enhanced skills for current jobs) than tangible ones (e.g. found a new job). The Coursera MOOCs study also suggested that course completers from non-OECD countries and those with lower levels of education were more likely to report tangible career benefits than their counterparts (Zhenghao et al., 2015[46]).

Learners are also attracted to alternative credential learning opportunities due to lower participation cost, shorter duration of learning and greater flexibility, compared to formal higher education programmes (Yuan and Powell, 2013[51]). In addition, some learners appear to be attracted by the possibility of obtaining credentials from highly selective HEIs. Part of the market that has emerged here is that programmes affiliated with highly prestigious institutions, often in business schools – like the Wharton School of the University of Pennsylvania – are permitting learners to acquire credentials that they may not otherwise be able to obtain, if required to obtain a seat through conventional selective programme and institutional admission requirements. According to the Class Central learner's survey in 2017, around half of learners who were willing to pay for a MOOC certificate reported that a HEI offering a course had a strong impact on their willingness to pay for a certificate (Shah, 2017[52]).

5. Stakeholder perspectives on alternative credentials

5.1. Employers

Do alternative credentials result in increased opportunities for employment, advancement and earnings? The labour market impact of credentials may result from **skills gained** in the course of acquiring alternative credentials, making workers more productive; or they may result from **improved signalling** of graduate skills, permitting employers to more reliably identify the quality of skills possessed by candidates; or some combination of the two. Because alternative credentials are not identified in the educational attainment component of national labour force surveys or in international surveys of adult skills (such as PIAAC), evidence on their effects on earnings of large-scale populations is unavailable. Nonetheless, one can identify four constraints that appear to currently limit the economic impact of these credentials, namely: unfamiliarity with these new credentials; their confusing signals; lack of standardised validation procedures; and relative quality of these credentials as a signal.

On balance, employers do not yet seem to view alternative credentials as substitutes for formal higher education qualifications; rather, they appear to see them as complements to formal qualifications. Although different views exist on the labour market relevance of degrees, a degree appears to still work as a signal of one's skills and knowledge. A survey of 750 hiring managers in the United States revealed that over half of the hiring managers found degrees were 'fairly reliable representations of candidates' skills and knowledge'; and that around three-quarters believed that degree completion was a 'valuable signal of perseverance and self-direction' (Gallagher, 2018[53]).

This limited function as a signal may partly be explained by **employers' unfamiliarity** with these credentials. The study of 750 human resources executives in the United States shows that only 20% have hired a person with verified certificates (e.g. MOOC certificates), 30% have encountered these certificates in a recruitment process, and 24% have never heard of these. A smaller share of the respondents reported the experience of hiring an individual with digital badges (14%) and micro-credentials (around 10%) (Gallagher, 2018[53]).

Indeed, in the above-mentioned survey, more than half of the employers reported that experience with previous hires and performance results is extremely or very important in determining the signalling quality of alternative credential issuers (Figure 5.1). Over half also listed other factors – namely operating history or longevity, validation by industry or evidence of alignment with employer needs, and general reputation and brand. Slightly above one-third responded that third-party endorsement of quality or accreditation is extremely or very important in determining the signalling quality of alternative credential issuers.

Confusing signalling of alternative credentials can also be another factor limiting the economic impact of these credentials. As mentioned, certificates, digital badges and micro-credentials do not have solid standards on delivery modes, duration, assessment processes, areas of focus, and their capacity to be embedded within or cumulate into other credentials. Therefore, it is more difficult for employers to tell what these credentials signal about applicants' skills, compared to formal education programmes. In other words, alternative credentials in general are not yet standardised to be a currency in the labour market (Pickard, 2018[5]).

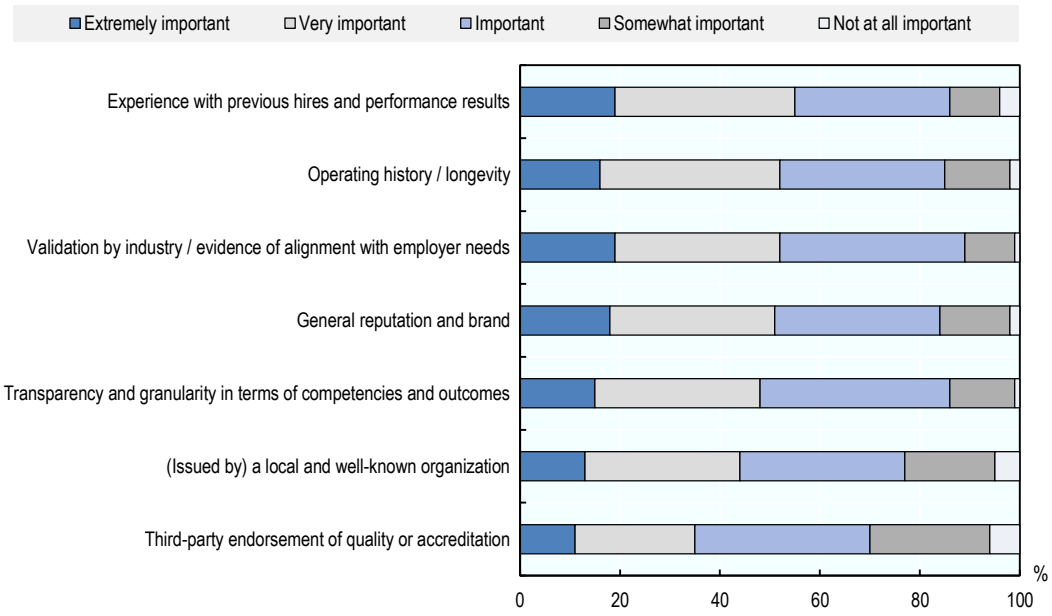
In addition, alternative credentials that **do not attempt to validate** one's skills or knowledge may only have a modest economic impact, since employers are unable to rely

upon these credentials to provide a reliable or comparable signal. This is likely to be the case with credentials awarded as a result of the completion of a learning experience (i.e. based on attendance and/or assignments).

Lastly, unless alternative credentials offer reliable information about relevant skills that has high quality standards, employers will use **other information**, such as professional experiences, and impact of these credentials will be marginal. For example, a recent study of the impact of digital skills certificates on freelancers' careers shows that experienced workers do not benefit from these certificates; in their case, platform-verified work history and employer feedback scores reduce employers' uncertainty about one's skills and knowledge (Kässi and Lehdonvirta, 2019[54]).

Figure 5.1. Factors determining the signalling quality of alternative credential issuers (2018)

A survey of 750 human resources executives in the United States



Source: Gallagher (2018[53]) Educational Credentials Come of Age: A Survey on the Use and Value of Educational Credentials in Hiring.

5.2. Governments and higher education stakeholder organisations

Governments across the OECD have played two principal roles with respect to higher education programmes: they have established arrangements to assure the quality of their provision, and directly or indirectly, subsidised this provision. As the offer of alternative credentials expands, governments have started seeking a way to standardise, assure the quality of, recognise, and fund alternative credentials.

New Zealand is taking a lead in addressing alternative credentials in their policies. The New Zealand Qualifications Authority (NZQA), a government agency responsible for assessment and qualifications, established specific criteria for training schemes and micro-credentials in 2018:

- A training scheme: a coherent arrangement of learning and training; based on aims, outcomes, content and assessment practices; leading to an award currently not recognised in the New Zealand Qualifications Framework (NZQF); and up to 40 credits (equivalent to a workload of one third of a full-time study year)
- A micro-credential: meeting all of the above-mentioned requirements; certifying achievement of a set of skills and knowledge; demonstrating evidence of demand from employers, industry and/or community; not duplicating learning opportunities approved by the NZQA; carrying out an annual review; and 5-40 credits (New Zealand Qualifications Authority, 2019[7]).

The NZQA individually reviews these credentials, which are provided by New Zealand HEIs, and approves and recognises those satisfying their quality standards (Table 5.1). The NZQA also evaluates the content of these credentials offered by HEIs outside of New Zealand and New Zealand organisations that are not HEIs, and issues statements presenting the credit value and level of such learning activities against the NZQF.

Table 5.1. NZQA micro-credential quality standards

Good evidence that the training scheme or micro-credential enables learners to achieve the intended outcomes and purpose
Good evidence that the training scheme or micro-credential is made up of components structured in a coherent way to achieve the outcomes and addresses the relevant needs of learners (if applicable)
Good evidence that the education organisation has the capability and resources to provide the training scheme or micro-credential
Good evidence that the education organisation can manage the impacts of any specific training scheme or micro-credential requirements
No significant gaps or weaknesses in the training scheme or micro-credential
No significant gaps or weaknesses in the self-assessment report, and/or the underlying capability and resources of the organisation
Demonstrable evidence that the learning outcomes and activities match the purpose of the micro-credential
Evidence the micro-credential addresses the identified unmet skill needs and is required or supported by relevant industries, employers or communities
Evidence that the micro-credential is in addition to current learning, and typically does not duplicate current quality-assured learning approved by NZQA

Note: The first six criteria are applicable for both training schemes and micro-credentials, and the last three are relevant only for micro-credentials.
Source: New Zealand Qualifications Authority (2019[7]), Guidelines for applying for approval of a training scheme or a micro-credential, www.nzqa.govt.nz/providers-partners/approval-accreditation-and-registration/micro-credentials/guidelines-training-scheme-micro-credential/ (accessed on 4 October 2019).

The New Zealand Tertiary Education Commission also introduced a public funding system for micro-credentials in 2019. All New Zealand HEIs are eligible to apply for the micro-credential funding that helps institutions deliver micro-credential programmes (Tertiary Education Commission, 2019[55]).

Other countries are also preparing to address alternative credentials in their policies. For example, in 2019 in Australia, the Expert Panel for the Review of the Australian Qualifications Framework (AQF) developed their suggested criteria for shorter-form credentials, including micro-credentials, and recommended offering credit for these credentials, rather than including them as qualifications in the AQF. Indeed, during the review, stakeholders in Australia were not in favour of incorporating these credentials into the AQF for several reasons, such as diversity in the provision of these new credentials, potential for an increased administrative burden and cost to regulators and providers, and

potential for delaying the speed of the provision of these credentials (Expert Panel for the Review of the Australian Qualifications Framework, 2019[56]).

Most of the European Union member countries have arrangements to recognise non-formal and informal learning, and have developed links to national qualification systems and frameworks (e.g. non-formal and informal learning can be used to acquire qualifications or credits within national qualification frameworks) (Cedefop, European Commission and ICF, 2017[57]).

In addition, several higher education stakeholder organisations have developed criteria that could be used to standardise alternative credentials. For example, in 2018, the New Paradigms in Recognition (PARADIGMS) project identified seven assessment criteria for online courses and in-company training programmes, namely 1) quality of the study programme, 2) verification of the certificate, 3) level of the study programme, 4) learning outcomes, 5) workload, 6) the way study results are tested, and 7) verified identification of the participant (Nuffic, 2018[58]).

The European MOOC Consortium also launched the Common Microcredential Framework (CMF) in 2019, aiming to set criteria for alternative credentials. The European MOOC Consortium suggests that courses meeting the following specifications should be qualified as a micro-credential:

- have a total study time of no less than 100 hours and no more than 150 hours, including revision for and completion of the summative assessment;
- be at level 6 or 7 in the European Qualification Framework, or the equivalent levels in the university's national qualification framework;
- provide a summative assessment that enables the award of academic credit, either directly following successful completion of a micro-credential or via recognition of prior learning upon enrolment as a student in the university's course of study;
- operate a reliable method of ID-verification at the point of assessment that complies with the university's policies and/or is widely adopted across the platforms authorised to use the CMF; and
- provide a transcript that sets out the learning outcomes of a micro-credential, total study hours required, EQF level and number of credit points (European MOOC Consortium, 2019[24]).

Based on the CMF, the German Forum for Higher Education in the Digital Age (*Hochschulforum Digitalisierung*) also proposed some criteria to assess the quality of micro-credentials in 2019, and suggested to recognise these credentials as the fifth cycle of the European Higher Education Area, complementing the existing short cycle, bachelor's, master's and doctorate programmes (Rampelt, Orr and Knoth, 2019[59]).

In the United States, co-ordinated public responses to alternative credentials have been led by non-governmental organisations. Since 2013, a non-profit organisation, Credential Engine, has developed an online registry presenting information on post-secondary credentials, including alternative credentials (Credential Engine, 2019[60]). It aims to help learners find post-secondary credentials that match their needs, by allowing them to compare information about credentials, including learning content, requirements, estimated time to earn, estimated costs, and graduates' labour market outcomes. In addition, the US Council for Higher Education Accreditation, an association that represents the private bodies engaged in higher education accreditation, has listed possible quality criteria for alternative credentials in their 2019 publication (van der Hijden, 2019[61]). With funding from Lumina Foundation, Rutgers' School of Management and Labour Relations also

developed a conceptual model of non-degree credential quality in 2019. The conceptual model identifies four steps in the provision of non-degree credentials, with set indicators in each step: 1) designing credentials, 2) developing competencies, 3) being exposed to the labour market, and 4) leading to economic and social outcomes (Van Noy, McKay and Michael, 2019[62]). Additionally, the International Organization for Standardization has been working on setting minimum requirements for learning provided outside of formal education (such as the ISO 29991:2014 and the ISO 29993:2017) (International Organization for Standardization, 2017[63]).

Table 5.2 summarises criteria and quality standards for alternative credentials set by different organisations across OECD countries. Intended learning outcomes, resulting qualifications and the way of verifying/assessing learning (e.g. a summative assessment) are included in all examples. Workload, verification of learner identity, and a level of the programme referenced against a qualification framework are also regarded as highly relevant to the provision and quality of alternative credentials. Other criteria and standards include the provider's ability and financial capacity, recognition as part of accredited programmes, demand from learners and employers, external and internal review, missions and purposes, accessibility and affordability, orientation (e.g. academically or professionally oriented), non-duplication (i.e. not duplicating existing programmes), the absence of significant weaknesses, stackability and transparency.

Early efforts to identify quality are heading in somewhat different directions, in response to different national and regional circumstances. In the United States, where there is no national qualifications framework or agreed national framework for credit recognition and transfer, proposed quality criteria are strongly output-oriented; the conceptual model of non-degree credentials of Rutgers' School of Management and Labour Relations uniquely covers economic and social outcomes of non-degree credentials, such as job attainment, wage gains and improved well-being. In Europe, where credit and qualification frameworks are well-established, these are being used to structure quality standards; these credentials are considered to be around 3-5 ECTS and to be allocated to specific levels of study (i.e. European Qualifications Framework level 6-7 – bachelor's and master's levels). In New Zealand, where micro-credentials appear to support workforce training and education needs, authorities have opted not to align to qualification levels in order to permit flexible and wide use against these needs; they instead rely upon measures such as workload, for example.

Few examples of funding systems for alternative credentials at the national level are found. Governments appear not to authorise higher education loan and grant programmes designed to support the acquisition of traditional academic qualifications to be extended to alternative credentials.

One measure open to governments reluctant to expose themselves to new and potentially risky investments in alternative credentials is to organise experimental or pilot initiatives. In 2016, the US Department of Education launched the Educational Quality through Innovation Partnerships programme, a pilot programme providing federal financial aid to low-income students enrolled in select programmes offered by non-traditional providers, typically working in collaboration with HEIs. The pilot authorised eight partnerships, including coding and software 'boot camp' programmes (U.S. Department of Education, 2016[64]). In 2017, the Singaporean Ministry of Education introduced the SkillsFuture Series, a series of short, industry-relevant training programmes focusing on eight emerging skills areas, including cyber security, data analytics and entrepreneurship. Over two-thirds of course fees are subsidised by the government for Singaporean citizens and permanent residents (Singaporean Ministry of Education, 2018[65]). The Indian Ministry of Human Resource Development invested over USD 30 million on the development of its online

course platform, SWAYAM, bearing the cost of creating and running courses, and allowing learners to take these courses for free, and take examinations that lead to certificates for free or at low cost (Indian Ministry of Human Resource Development, 2018[66]).

Table 5.2. Examples of alternative credential criteria and quality standards

	Formal action	Formal and informal recommendations					
	New Zealand Qualifications Authority (2018)	Expert Panel for Review of Australian Qualifications Framework (2019)	New Paradigms in Recognition project (2018)	European MOOC Consortium (2019)	German Forum for Higher Education in Digital Age (2019)	US Council for Higher Education Accreditation (2019)	Rutgers School of Management and Labour Relations and Lumina Foundation (2019)
Intended learning outcomes	○	○	○	○	○	○	○
Qualifications	○	○	○	○	○	○	○
Verification / assessment	○	○	○	○	○	○	○
Workload	○ (up to 40 credits)	○	○	○ (100-150 hours)	○ (100-150 hours/3-5 ECTS)	○	
Verification of learner identity		○	○	○	○	○	
Accreditation / recognition				○	○	○	○
Employers' demand	○				○	○	○
Level			○	○ (EQF level 6-7)	○ (EQF level 6-7)	○	
Provider's capability	○		○			○	○
External or internal review	○	○			○		
Learners' demand	○				○	○	
Mission / purpose	○	○				○	
Absence of significant weaknesses	○						
Accessibility and affordability							○
Labour market outcomes							○
Non-duplication	○						
Orientation						○	
Stackability							○
Transparency							○

Note: ECTS = European Credit Transfer and Accumulation System / EQF = European Qualifications Framework. *Source*: New Zealand Qualifications Authority (2019[7]), Guidelines for applying for approval of a training scheme or a micro-credential; Expert Panel for the Review of the Australian Qualifications Framework (2019[56]), Review of the Australian Qualifications Framework: Final Report; Nuffic (2018[58]), Oops a MOOC! Dealing with eclectic learning in credential evaluation; European MOOC Consortium (2019[24]), The European MOOC Consortium (EMC) launches a Common Microcredential Framework (CMF) to create portable credentials for lifelong learners; Rampelt, Orr and Knoth (2019[59]), Bologna Digital 2020: White Paper on Digitalisation in the European Higher Education Area; van der Hijden (2019[61]), Digitization of Credentials: Quality of Shorter-Term Educational Experiences; Van Noy, McKay and Michael (2019[62]), Non-Degree Credential Quality: A Conceptual Framework to Guide Measurement.

6. Conclusion

The scale of alternative credentials – defined here as certificates, badges, and micro-credentials – has expanded considerably, as a consequence of a rising demand for upskilling and reskilling, as well as a sharp reduction in the unit cost of education and training provision made possible by digitalisation. HEIs, businesses and other institutions are actively offering alternative credentials that help learners acquire new skills, update their existing skills, and signal the competencies they already have.

It appears that alternative credentials do not yet serve as "alternative" to a formal post-secondary education qualification; rather, they serve to complement prior education, experience, and training. Employers still seem to view a degree as a signal of an individual's skills and knowledge. The majority of learners also seek alternative credentials in addition to formal post-secondary education qualifications. However, alternative credentials may have a near-term potential to become a substitute for some formal post-secondary education qualifications in selected sectors where alternative credentials are well known and recognised, and are successful at attracting non-traditional learners, such as the IT sector. Likewise, micro-credentials that attempt to substitute for substantial parts of postgraduate education programmes – such as so-called MicroMasters credentials – may provide learners with skills and quality signals faster and at lower prices than traditional postgraduate programmes, which can be costly.

Some factors limiting the labour market impact of these credentials are visible, namely employers' unfamiliarity with these credentials, their confusing signals caused by lack of standardisation, absence of validation procedures (in some cases), and relative value of these credentials as a signal compared to other factors, such as professional experiences. Standardisation with more strict validation may help increase the reliability of alternative credentials as a signal of skills and qualifications. Because professional growth and career advancement are predominant reasons for the acquisition of alternative credentials, problems of quality and comparability may also serve as a brake on their further growth.

The expansion of the alternative credentials market may increase hierarchal relationships among and within higher education systems. The majority of MOOCs continue to be delivered in English, giving an easier access to the market to HEIs in Anglophone countries, already highly competitive in the international higher education market. Because learners often choose alternative credentials – educational certificates and micro-credentials – provided by HEIs with prominent reputations, prestigious Anglophone institutions are especially well-positioned to take advantage of new digital platforms to become globalised providers.

As the size of the alternative credentials market grows, governments may consider establishing quality frameworks for these programmes, both to protect consumers who have invested their own money and to provide a sufficient assurance of quality to support accountable public spending. However, an important advantage of alternative credential programmes lies in the speed and flexibility with which they can respond to the demands of both employers and students, and finding quality assurance arrangements that offer sufficient space for innovation and appropriate assurance of quality are, for most OECD countries, some way off.

The paper has attempted to identify preliminary findings on the emergence of new credentials. Along with the development of clear taxonomies, further research on the employers' perspective will give more insights into the value of alternative credentials.

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