

# **5 Adult learning and technology in Latin America**

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This chapter investigates the new opportunities that digitalisation offers for adult learning, in the shape of open education and massive open online courses (MOOCs). In Latin American countries, patterns of participation in online learning activities tend to reproduce gaps in participation in standard forms of adult learning. Highly skilled, highly educated individuals are more likely to benefit from these new learning opportunities.

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## Summary of the main insights

Digitalisation transforms workplaces and Latin American countries need to foster high quality, flexible options for learning at all stages of life.

- Latin American countries are lagging behind in terms of exposure to digitalisation, but as technologies progressively permeate every aspect of work and societies, this situation is expected to change rapidly in the future. Latin American individuals and workers will need to be equipped with a well-rounded set of skills to be able to adapt to these changes.
- Skills are crucial to thrive in an increasingly digital and interconnected world, but Latin American countries perform poorly in terms of their populations' skills. Latin American countries display particularly large shares of young people lacking basic skills. In Ecuador and Peru, almost half of young people aged in 16-24 perform poorly in literacy, numeracy and problem solving in technology-rich environments. The same holds for prime-age individuals: more than 60% of them lack basic skills.
- In Latin American countries, participation in formal and non-formal job-related adult learning is not widespread. Around 24% of adults in Latin American countries, who wanted to participate (more) in training, did not do so because training was too expensive. In contrast, this is the case for only 16% of adults in OECD countries. More worryingly, a large share of adults in OECD (50%) and Latin American countries (57%), do not participate and do not want to participate in training.
- New technologies can contribute to finding a solution to these problems by providing new opportunities for developing skills and engaging individuals who may find standard forms of adult training to be of difficult access, ineffective or of insufficient quality.

Open or distance education tends to reproduce inequalities in participation observed also in 'standard' adult learning.

- Latin American countries with available data in the OECD Survey of Adult Skills, a product of the Programme for the International Assessment of Adult Competencies (PIAAC), display, on average, larger levels of participation in open or distance education than the average of OECD countries. Shares of adults engaging in such courses in Latin America range from 8% in Peru to 13% in Chile.
- Many individuals engage in open or distance education for job-related reasons and tend to find it useful. Around 55% of Latin American adults who engage in open or distance education do so in order to perform better at their jobs and to improve their career prospects. Personal interests or desire to enhance one's knowledge or skills in a specific area come second among reasons for participation. This pattern holds in OECD and Latin American countries alike. Individuals who combine work and education are the most numerous to engage in open education.
- In Latin American and OECD countries alike, participation levels in open and distance education increase with the level of skills (whether in literacy or problem solving in technology-rich environments) and with educational attainment. Conversely, workers who lack a contract in their current job are less likely to engage in open or distance education.
- Age plays an important role in explaining participation in open or distance education in Latin America. Around 58% of adults who engage in open and distance education are 20-40 years old in Latin American countries. They represent 52% of participants in OECD countries.

- Patterns of participation in open and distance education tend to reproduce or even amplify patterns of participation in standard forms of adult learning. Engaging low-skilled workers in adult learning remains a challenge that does not seem to improve when looking at the participation in open and distance education.

There is scope to further harness the potential of massive open online courses (MOOCs).

- MOOC enrolments have disproportionately come from very developed countries (scoring very high on the Human Development Index). A large number of Latin American countries, including Brazil, Colombia, Costa Rica, Mexico, score 'high' in the Human Development Index whereas only Argentina and Chile are rated as 'very high'.
- In a similar vein to open education and standard forms of adult training, participation in MOOCs has tended to be higher among the highly skilled, highly educated and among individuals with higher socio-economic status. Latin American countries display a similar pattern of participation in MOOCs. Data from edX MOOC participants in 2012-2013 showed that in Latin America, most MOOC participants were very young (the median age of participants was 26 years old), mostly men (76%), and holding a Bachelor or a Master's degree (more than 60% of participants).

### Setting the scene: Adult learning in a digital world of work

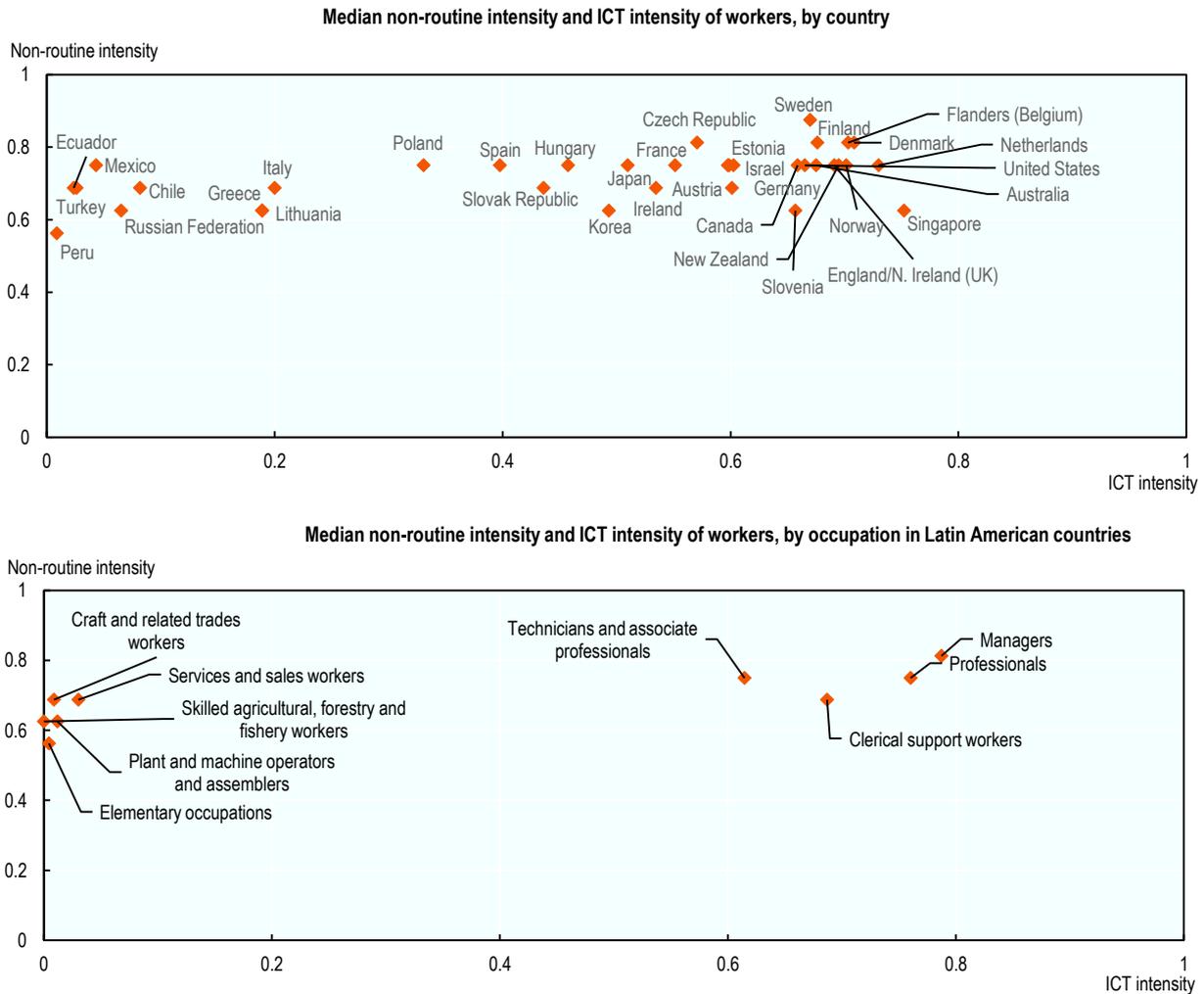
Digitalisation reshapes the world of work and societies, raising the need to train and develop skills throughout life. The new technological wave is already transforming occupations. The increasing use of new technologies in workplaces can substitute workers in the performance of routine tasks or complement them in other tasks (Autor, Levy and Murnane, 2003<sup>[1]</sup>), thereby changing the skills needed on the job. Despite many of the changes being digital in nature, workers will need much more than just digital skills to adapt (OECD, 2019<sup>[2]</sup>). Acquiring digital skills, in fact, will not be sufficient to shield workers from the radical transformation happening in the labour market and even occupations that are at the frontier of new technologies (e.g. software developers, big data specialists) will require a good level of cognitive skills and socio-emotional skills (OECD, 2019<sup>[2]</sup>).

Latin American countries are lagging behind in terms of exposure to digitalisation. Among countries with available data in the OECD Survey of Adult Skills (PIAAC), Chile, Ecuador, Mexico and Peru display particularly low levels of adoption of information and communications technology (ICT) at work (Figure 5.1).<sup>1</sup> The informal sector, relatively large in Latin American economies, is likely not to be fully captured by these statistics since the OECD Survey of Adult Skills (PIAAC) does not allow identifying informal workers based on the standard definition of informality. ICT and non-routine intensities for Latin American countries with available data in the OECD Survey of Adult Skills (PIAAC) may therefore be overestimated if informal workers use ICT less intensively at work and have more routine-intensive jobs. As technologies progressively permeate every aspect of work and societies, this situation is expected to change rapidly in the future and workers in the region will certainly need to be equipped with a well-rounded set of skills to be able to adapt to these changes.

Differences in the nature of occupations and their skills proficiency (literacy and computer skills) account for a large share of the observed differences across countries in their overall exposure to digitalisation in the workplace, as measured by the ICT intensity and non-routine intensity indicators (OECD, 2019<sup>[2]</sup>). In Latin American (Figure 5.1) and OECD countries (OECD, 2019<sup>[2]</sup>), occupations largely differ in their exposure to digitalisation. High-skilled occupations, such as managers or professionals perform more intensively ICT and non-routine tasks at work. Such occupations are unlikely to experience substantial changes, although advances in machine learning or artificial intelligence may further alter the tasks carried out at work by those workers. In contrast, workers in occupations with low ICT intensity and non-routine

intensity, such as elementary occupations or plant and machine operators are likely to see substantially changes in their jobs. Some of their tasks may be automated, whereas the introduction of new technologies in their workplace will require them to increasingly work with ICT.

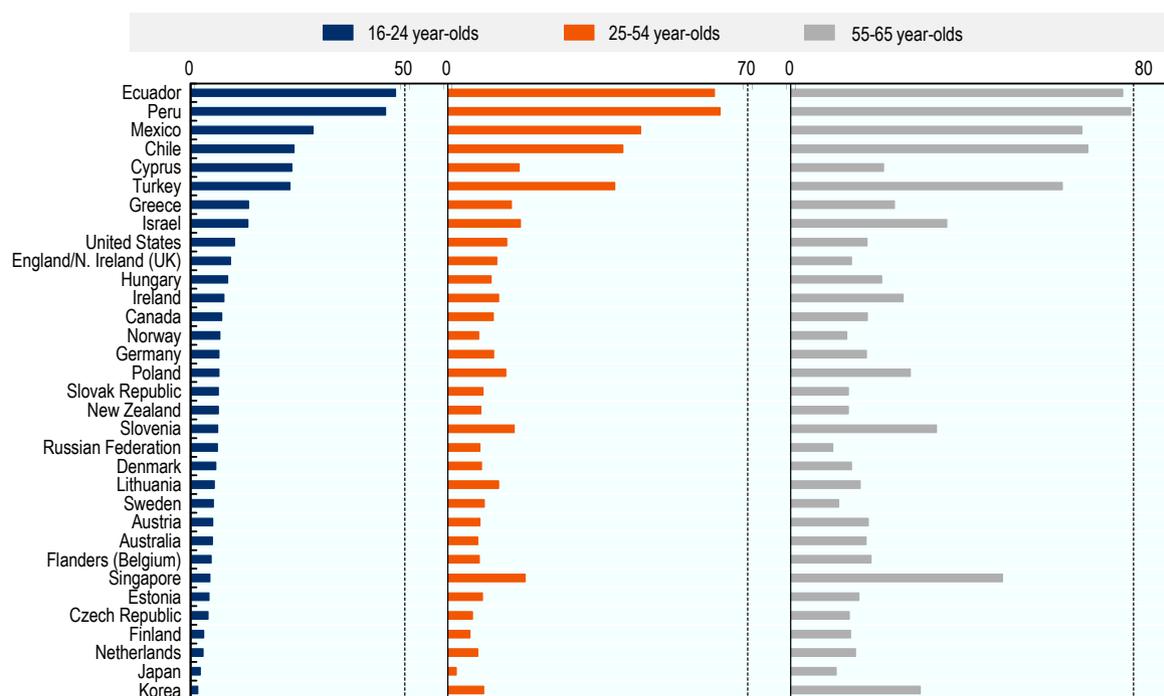
**Figure 5.1. Latin American countries and occupations' exposure to digitalisation**



Note: Indicators are based on the OECD Skills Outlook 2019 (OECD, 2019<sup>[2]</sup>). The top panel plots countries' median non-routine and ICT intensities across all workers, while the bottom panel plots one-digit occupations' median non-routine and ICT intensities across all workers of that group of occupations in all countries. For example, the median non-routine intensity across all workers in Turkey is 0.7, meaning that 50% of all workers in Turkey are in jobs with a non-routine intensity above 0.7 and 50% are in jobs with a non-routine intensity below 0.7. The non-routine intensity of jobs indicator is computed following the methodology proposed by (Marcolin, Miroudot and Squicciarini, 2016<sup>[3]</sup>) and builds on items that capture the extent to which one's job is codifiable and sequentiable. It is close to 0 when the job is routine-intensive and to 1 when the job is not routine-intensive. The ICT intensity of jobs indicator was developed in work by (Grundke et al., 2017<sup>[4]</sup>) and describes tasks associated with ICT use, from reading and writing emails to using word-processing or spreadsheet software, or a programming language. It is close to 0 when the job is not ICT-intensive and to 1 when the job is ICT-intensive. Chile, Greece, Israel, Lithuania, New Zealand, Singapore, Slovenia and Turkey: year of reference 2015. Ecuador, Hungary, Mexico, Peru and the United States: Year of reference 2017. All other countries: year of reference 2012. Data for Belgium refer only to Flanders and data for the United Kingdom refer to England and Northern Ireland jointly. Source: OECD calculations based on OECD (2017<sup>[5]</sup>), *Survey of Adults Skills (PIAAC) (2012, 2015, 2017)*, (database), <http://www.oecd.org/skills/piaac/>.

**Figure 5.2. Share of individuals lacking basic skills by age groups**

Share of youth (16-24), prime age adults (25-54) and older people (55-65) lacking basic skills, by country (%)



Note: Indicator developed based on (OECD, 2019<sup>[2]</sup>). Individuals lacking basic skills score at most Level 1 (inclusive) in literacy and numeracy and at most Below Level 1 (inclusive) in problem solving (including failing ICT core and having no computer experience). Chile, Greece, Israel, Lithuania, New Zealand, Singapore, Slovenia and Turkey: Year of reference 2015. Ecuador, Hungary, Mexico, Peru and United States: Year of reference 2017. All other countries: Year of reference 2012. Data for Belgium refer only to Flanders and data for the United Kingdom refer to England and Northern Ireland jointly.

Source: OECD calculations based on OECD (2017<sup>[5]</sup>), *Survey of Adults Skills (PIAAC) (2012, 2015, 2017)*, (database),

<http://www.oecd.org/skills/piaac/>.

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Fostering high quality, flexible options for learning at all stages of life are crucial challenges. In Latin American countries, participation in formal and non-formal job-related adult learning is not widespread (Figure 5.3). The average participation in adult learning across Latin American countries remains below the OECD average (OECD, forthcoming<sup>[6]</sup>), despite Latin American countries outperforming some OECD countries such as Greece, Italy and Turkey. Indeed, large disparities in participation patterns are present both among OECD countries and Latin American countries.

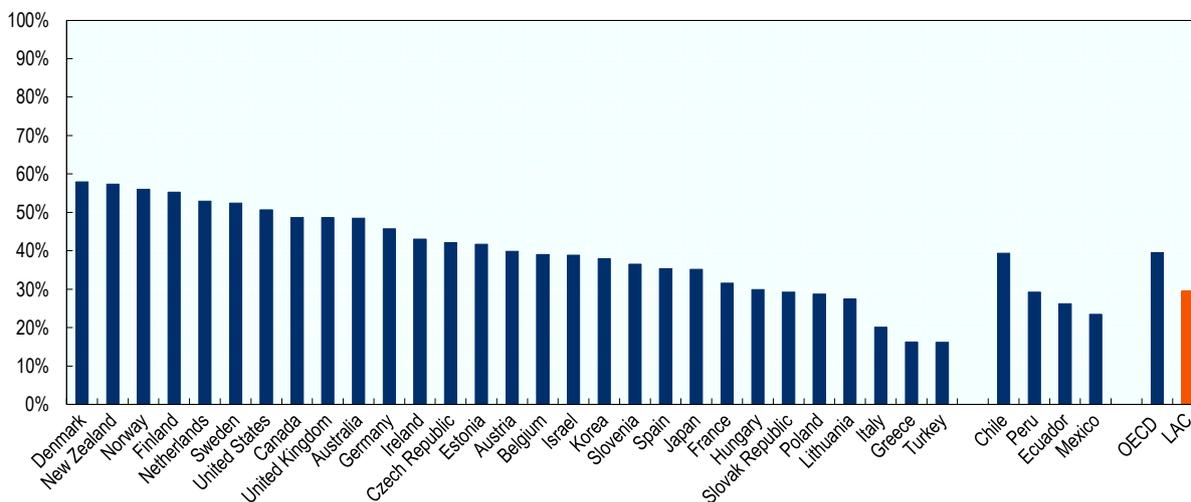
Several reasons can explain the low participation of adults in adult learning activities. One of the main barriers for participation relates to financial costs (Figure 5.4). Around 24% of adults in Latin American countries with available data in the OECD Survey for Adult Skills (PIAAC), who wanted to participate (more) in training, did not do so because training was too expensive. In contrast, this is the case for only 16% of adults in OECD countries. More worryingly, a large share of adults in OECD (50%) and Latin American countries (57%), do not participate and do not want to participate in training (OECD, forthcoming<sup>[6]</sup>).

As in the case of initial education, new technologies can contribute to find a solution to these problems by providing new opportunities for developing skills and engaging individuals who may find standard forms of adult training to be of difficult access, ineffective or of insufficient quality.

Evidence shows already that workers in more digital-intensive work environments are generally more likely to maintain their skills and they are also more prone to learn by doing, keep their skills up to date and learn from co-workers (OECD, 2019<sup>[2]</sup>). Beyond the opportunities to learn by doing in a digital workplace, digitalisation also bring many options for developing skills (outside and at work) through the rise of alternative and potentially less expensive and more flexible forms of learning, such as open education and MOOCs.

**Figure 5.3. Participation in adult learning**

Percentage of adults who participated in formal or non-formal job-related adult learning in the past 12 months

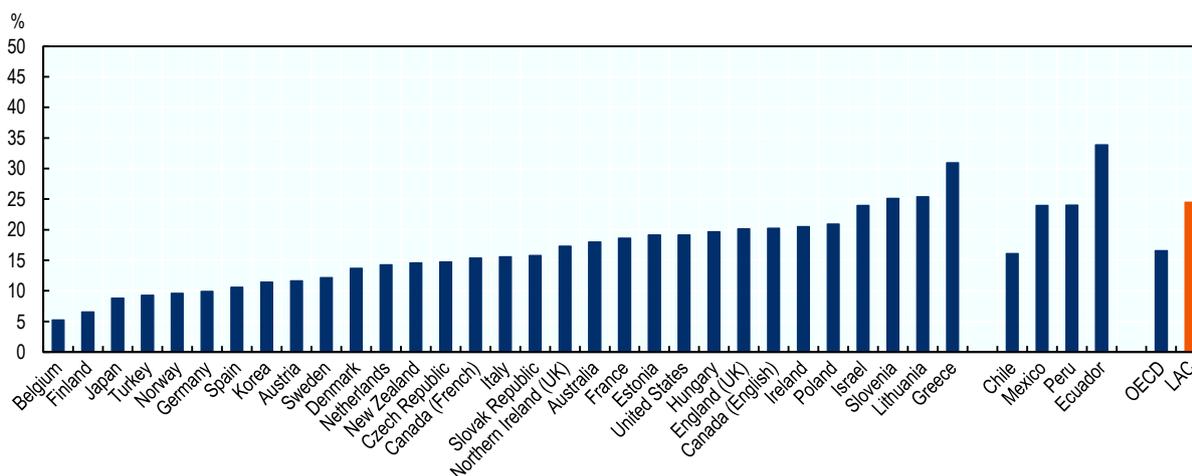


Source: OECD (2019<sup>[7]</sup>), Dashboard on Priorities for Adult Learning, <http://www.oecd.org/employment/skills-and-work/adult-learning/dashboard.htm>.

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**Figure 5.4. Financial barriers to participation in adult training**

Share of adults who wanted to participate (more) in training, but did not because too expensive



Source: OECD (forthcoming<sup>[6]</sup>), *Adult Learning Systems in Latin America and the Role of Employers*.

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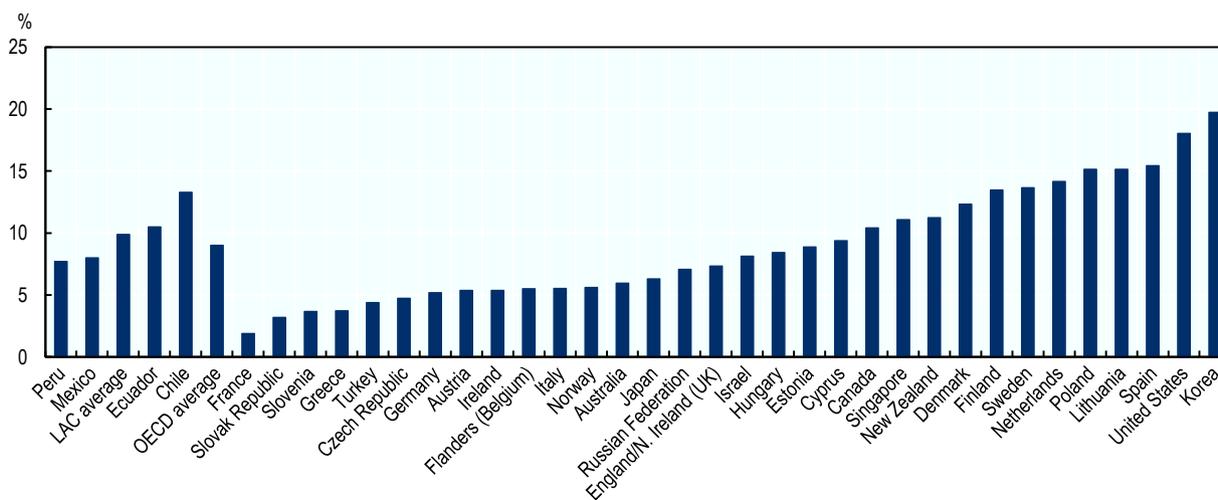
## Open education reproduces inequalities in participation in standard adult learning

The OECD Survey of Adult Skills (PIAAC) provides evidence on patterns of participation in open or distance education. These courses do not result in formal qualifications and are “similar to face-to-face courses but take place via postal or correspondence or electronic media, linking together instructors, teachers and tutors or students who are not together in the classroom” (OECD Survey of Adult Skills (PIAAC), n.d.[8]).

Latin American countries with available data in the OECD Survey of Adult Skills (PIAAC) display, on average, larger levels of participation in open or distance education than the average of OECD countries (Figure 5.5). Shares of adults engaging in such courses range from 8% in Peru to 13% in Chile. That being said, OECD countries display considerable variation in participation patterns, from less than 2% of adults in France to almost 20% in Korea.<sup>2</sup>

**Figure 5.5. Participation in open education**

Percentage of the population having participated in open or distance education in the 12 months before the survey, 16- 65-year-olds



Note: In the PIAAC questionnaire, open or distance education is defined as not leading to formal qualification. It covers courses that are similar to face-to-face courses but take place via postal or correspondence or electronic media, linking together instructors, teachers and tutors or students who are not together in the classroom. Chile, Greece, Israel, Lithuania, New Zealand, Singapore, Slovenia and Turkey: Year of reference 2015. Ecuador, Hungary, Mexico, Peru and the United States: Year of reference 2017. All other countries: Year of reference 2012. Data for Belgium refer only to Flanders and data for the United Kingdom refer to England and Northern Ireland jointly.

Source: OECD calculations based on OECD (2017[5]), *Survey of Adults Skills (PIAAC) (2012, 2015, 2017)*, (database),

<http://www.oecd.org/skills/piaac/>.

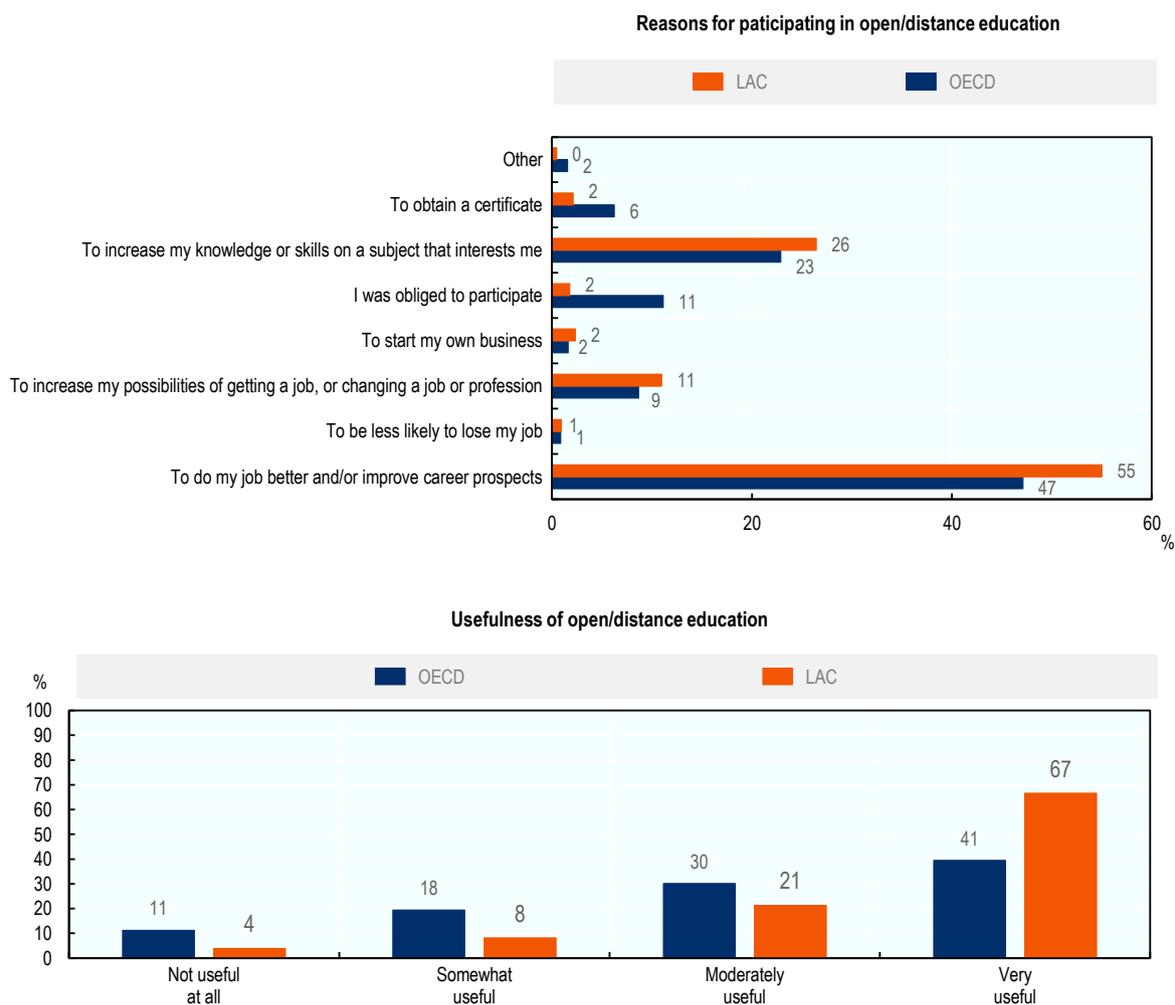
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Many individuals engage in open or distance education for job-related reasons and tend to find it useful (Figure 5.6). This pattern holds in OECD and Latin American countries alike. Around 55% of Latin American adults who engage in open or distance education do so in order to perform better at their jobs and to improve their career prospects. Personal interests or desire to enhance one’s knowledge or skills in a specific area come second among reasons for participation.

In fact, those who are closest to the labour market, whether employed or unemployed, tend to use open or distance education the most (Figure 5.7). Latin American countries display a similar pattern to OECD countries, although in Mexico the share of participants in open or distance education who are unemployed is even larger than that of those who participate in education while being employed. Individuals who combine work and education are the most numerous to engage in open education, suggesting that open or distance education paths provide flexible opportunities for students to developing skills and acquiring knowledge while combining work obligations (OECD, 2019<sup>[2]</sup>).

**Figure 5.6. Reasons for and usefulness of participation in open/distance education**

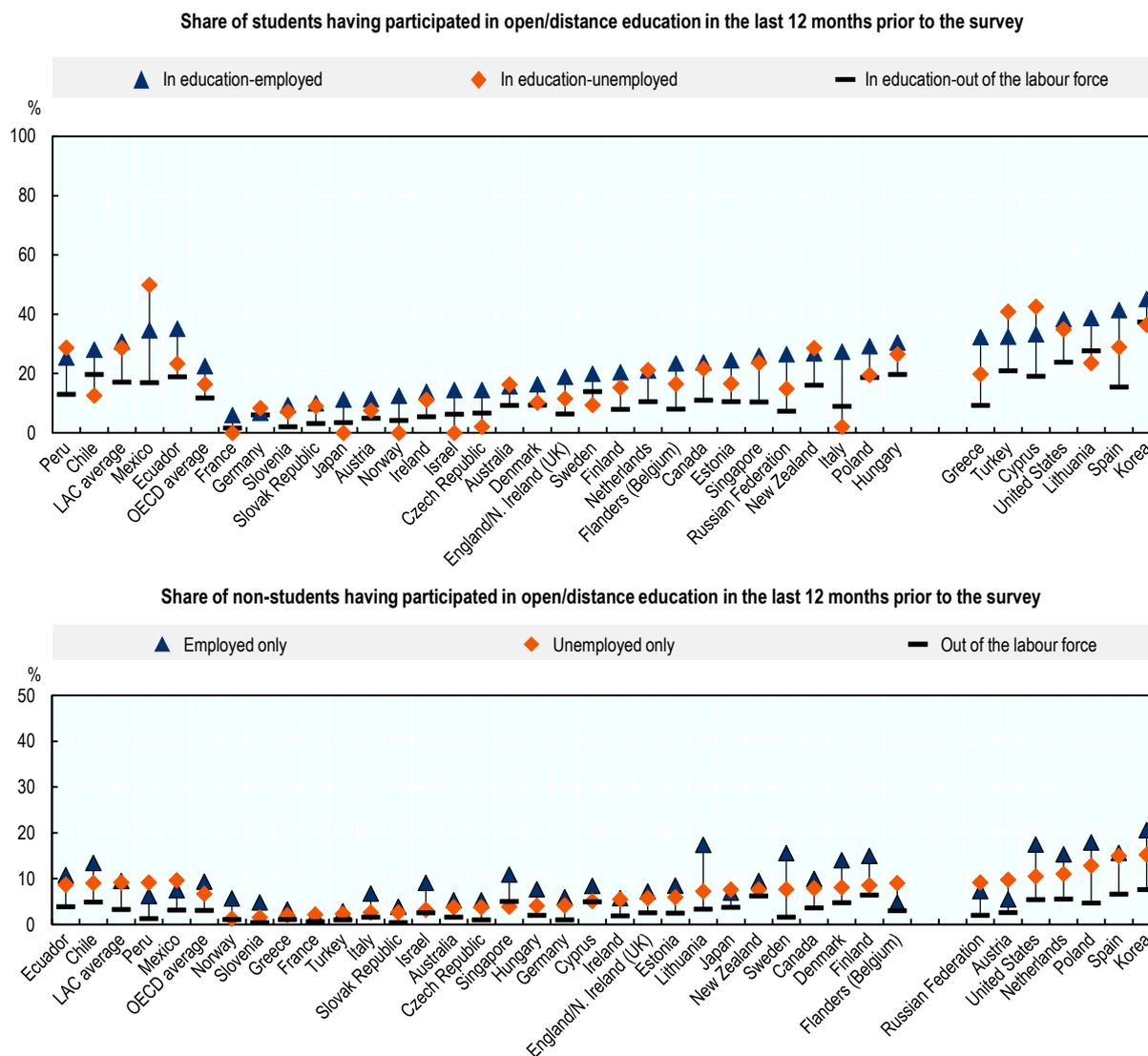
Share of individuals who have participated in open/distance education in the 12 months before the survey



Source: OECD calculations based on OECD (2017<sup>[5]</sup>), *Survey of Adults Skills (PIAAC)* (2012, 2015, 2017), (database), <http://www.oecd.org/skills/piaac/>.

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Figure 5.7. Participation in open education by employment and education status



Note: In the PIAAC questionnaire, open or distance education is defined as not leading to formal qualification. It covers courses that are similar to face-to-face courses but take place via postal or correspondence or electronic media, linking together instructors, teachers and tutors or students who are not together in the classroom. The first panel considers the share of individuals who declare not to be in formal education and have participated in open/distance education. The second panel considers the share of individuals who declare to be in formal education and have participated in open/distance education. Chile, Greece, Israel, Lithuania, New Zealand, Singapore, Slovenia and Turkey: Year of reference 2015. Ecuador, Hungary, Mexico, Peru and the United States: Year of reference 2017. All other countries: Year of reference 2012. Data for Belgium refer only to Flanders and data for the United Kingdom refer to England and Northern Ireland jointly.

Source: OECD calculations based on OECD (2017<sup>[5]</sup>), *Survey of Adults Skills (PIAAC) (2012, 2015, 2017)*, (database),

<http://www.oecd.org/skills/piaac/>.

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## Participation in standard adult learning and open education is weaker amongst those who are most likely to benefit from training

Older individuals, the low skilled, with lower educational levels are less likely to participate in formal and non-formal job-related training (OECD, 2019<sup>[9]</sup>). As in most OECD countries, Latin American countries with available data display significant gaps in participation in adult learning by age, education level, wage and employment status. Older workers and less skilled individuals (Figure 5.8) display significantly lower levels of engagement in adult learning, but only a limited gap emerges between unemployed and employed individuals in Latin American countries.

Among the OECD countries with available data for assessing the inclusiveness of job-related adult learning, Chile was one of the poorest performing countries, showing the largest gap in participation between older and prime-age workers as well as between low-skilled and medium/high-skilled workers (OECD, 2019<sup>[9]</sup>). At the same time, among Latin American countries, Chile displays the best performance in terms of adults' participation in formal or non-formal learning.

In Latin American and OECD countries alike, participation levels in open and distance education increase with the level of skills (whether in literacy or problem solving in technology-rich environments) and with educational attainment. Preliminary evidence from experimental research shows that online degrees can potentially expand the number of individuals accessing education (Box 5.1). Nevertheless, such expansions are likely to benefit those with better skills (digital and non-digital), better access to ICT infrastructure or higher motivation to train. Patterns of participation in open and distance education tend to reproduce and even amplify patterns of participation in standard forms of adult learning. Engaging low-skilled workers in adult learning remains a challenge that does not seem to improve when looking at the participation in open and distance education.

### Box 5.1. Georgia Tech's Online Master of Science in Computer Science

Goodman, Melkers and Pallais (2019<sup>[10]</sup>) bring first evidence related to the effectiveness of online degrees at expanding the number of people enrolling in higher education.

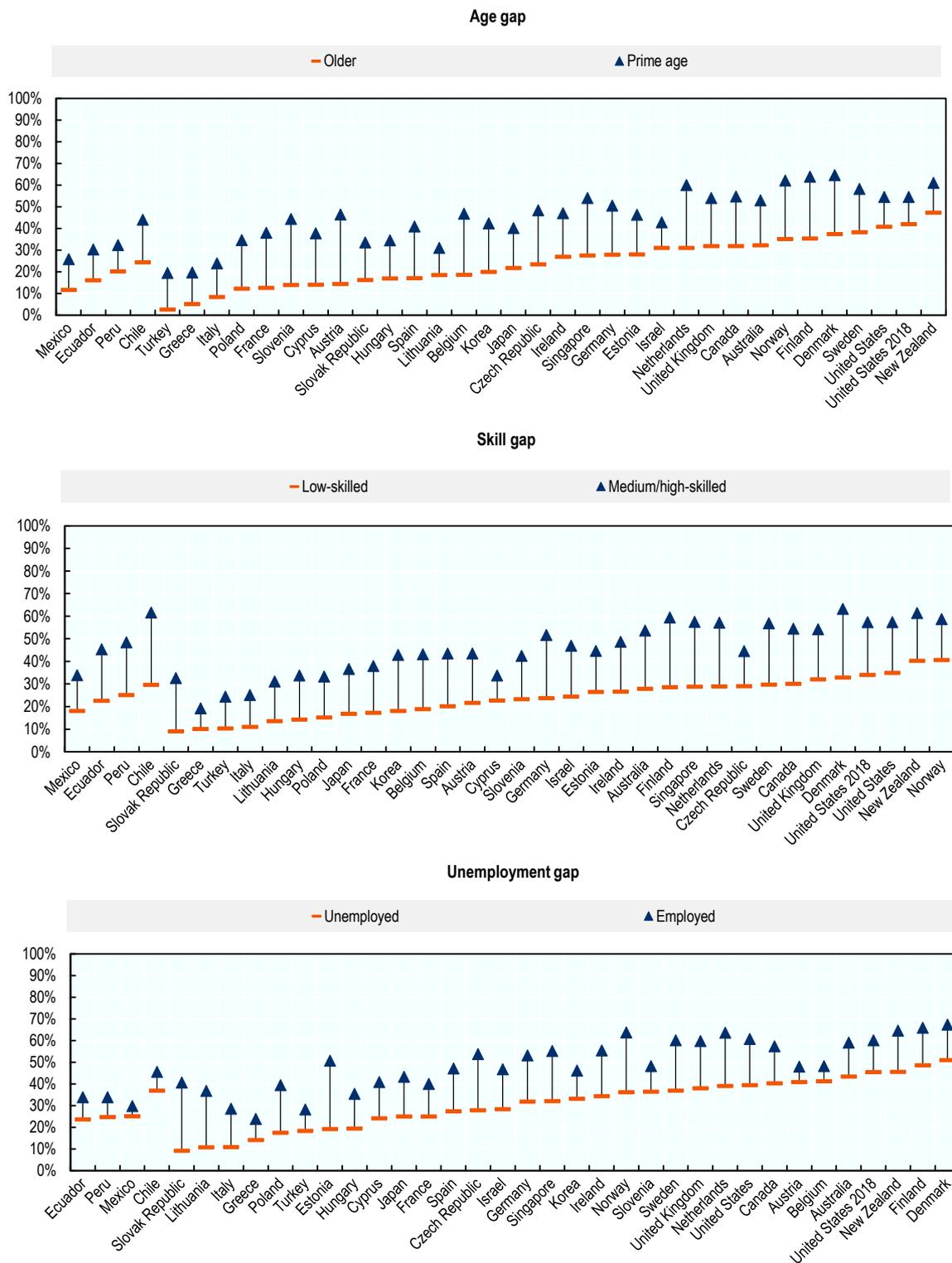
Their evaluation focuses on Georgia Tech's Online Master of Science in Computer Science. Using a regression discontinuity design, they show that access to the online programme increases educational enrolment substantially. The online programme drew primarily mid-career individuals in contrast to younger applicants for the in-person version. The evaluation suggested that the online degree managed to fill a gap in traditional education, by drawing individuals who would not have enrolled otherwise and providing high-quality instruction. Indeed, the degree is provided by a highly regarded institution, online students slightly outperformed in-person ones and the degree had a significantly lower cost than its in-person version.

In 2019, Georgia Tech's Online Master of Science in Computer Science had more than 9 000 students (Class Central, 2019<sup>[11]</sup>).

Source: Class Central (2019<sup>[11]</sup>), By The Numbers: MOOCs in 2019 — Class Central, <https://www.classcentral.com/report/mooc-stats-2019/>; Goodman J., J. Melkers and A. Pallais (2019<sup>[10]</sup>), "Can online delivery increase access to education?", *Journal of Labor Economics*, <http://dx.doi.org/10.1086/698895>.

**Figure 5.8. Gaps in participation in adult learning**

Share of adults who participated in formal or non-formal job-related adult learning in the past 12 months

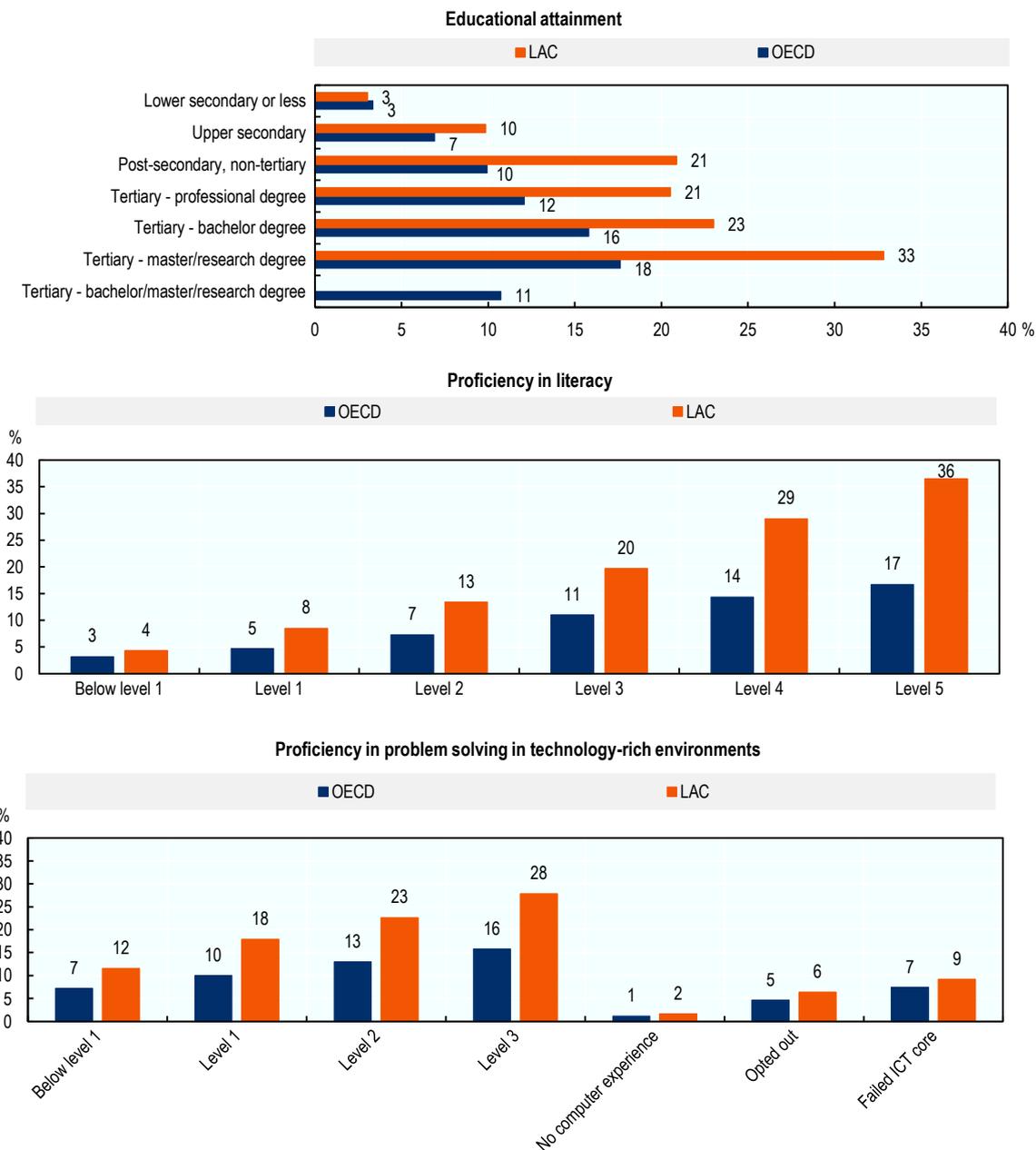


Source: OECD (2019<sup>[7]</sup>), Dashboard on Priorities for Adult Learning, <http://www.oecd.org/employment/skills-and-work/adult-learning/dashboard.htm>.

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**Figure 5.9. Participation in open/distance education by educational attainment and skills proficiency**

As a percentage of each category



Note: In the PIAAC questionnaire, open or distance education is defined as not leading to formal qualification. It covers courses that are similar to face-to-face courses but take place via postal or correspondence or electronic media, linking together instructors, teachers and tutors or students who are not together in the classroom.

Source: OECD calculations based on OECD (2017<sup>[5]</sup>), Survey of Adults Skills (PIAAC) (2012, 2015, 2017), (database),

<http://www.oecd.org/skills/piaac/>.

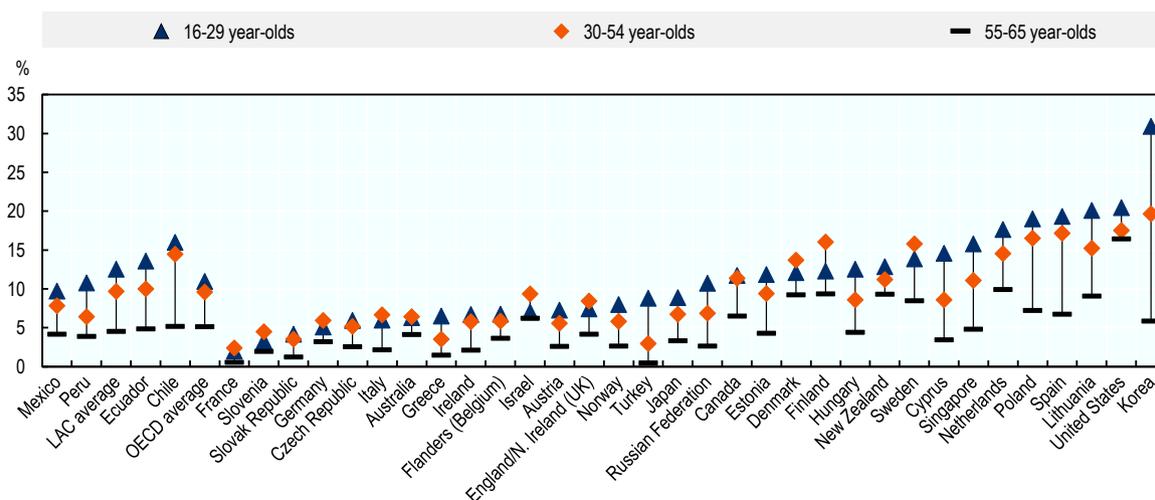
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When focusing on Latin America, individuals who are most in need of reskilling or upskilling are yet the least likely to leverage new technologies for learning (Figure 5.9). In addition, open and distance education benefits younger people more (Figure 5.10) and older individuals, less familiar with new technologies, are the least likely to participate in these forms of learning. Evidence shows that around 58% of adults who engage in open and distance education are aged 20-40 years old in Latin American countries. They represent 52% of participants in OECD countries.

Labour market informality is yet another piece of the equation. Informality is widespread in many Latin American countries, representing around half of employment. Informality is higher in rural areas, among women and less-educated workers (ILO, 2018<sup>[12]</sup>). This situation translates into a “social vulnerability trap” in Latin America. Informal workers usually have a low and unstable income and no access to social protection, and, as such, have limited resources to devote to training. This makes them less productive relative to more educated and skilled peers hindering, in turn, their chances of accessing formal and better quality jobs. Likewise, informal workers have reduced opportunities for learning and training as they are generally less likely to be granted access to formal training programmes and employers in the informal sector are less likely to have any incentives or resources to devote to training (OECD et al., 2019<sup>[13]</sup>). Evidence from the OECD Survey of Adult Skills (PIAAC) for Latin American countries shows that workers who lack a contract in their current job are less likely to engage in open or distance education (Figure 5.11). In certain cases, for instance in Ecuador and Peru, gaps in participation between workers in the formal and informal labour market exceed 10 percentage points.

**Figure 5.10. Participation in open/distance education by age**

Percentage of the population having participated in open or distance education in the 12 months prior to the survey, by age group



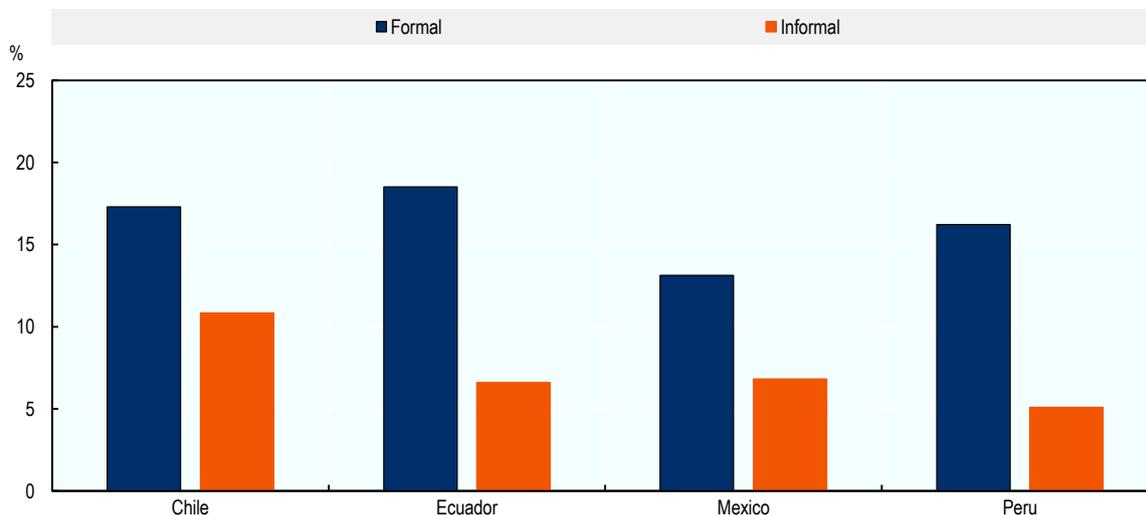
Note: In the PIAAC questionnaire, open or distance education is defined as not leading to formal qualification. It covers courses which are similar to face-to-face courses but take place via postal or correspondence or electronic media, linking together instructors, teachers and tutors or students who are not together in the classroom. Individuals aged 16 to 19 in formal compulsory education were not asked the questions. Chile, Greece, Israel, Lithuania, New Zealand, Singapore, Slovenia and Turkey: Year of reference 2015. Ecuador, Hungary, Mexico, Peru and United States: Year of reference 2017. All other countries: Year of reference 2012. Data for Belgium refer only to Flanders and data for the United Kingdom refer to England and Northern Ireland jointly.

Source: OECD calculations based on OECD (2017<sup>[5]</sup>), *Survey of Adults Skills (PIAAC) (2012, 2015, 2017)*, (database), <http://www.oecd.org/skills/piaac/>.

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### Figure 5.11. Participation in open/distance education and informality

Share of individuals who have participated in open/distance education in the 12 months before the survey, by presence of contract in current job



Note: Individuals in informal employment are defined as individuals in employment who have no contract in their current job.

Source: OECD calculations based on OECD (2017<sup>[5]</sup>), *Survey of Adults Skills (PIAAC) (2012, 2015, 2017)*, (database),

<http://www.oecd.org/skills/piaac/>.

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### There is scope to further harness the potential of MOOCs in reaching those most in need of training

The rise of MOOCs has broadened the opportunities brought about by open education for developing skills at any time, from any place, with access to training provided by top universities or leading experts in the field. In 2019, there were around 110 million MOOC users worldwide (excluding the People's Republic of China), attending courses from more than 900 universities (Class Central, 2019<sup>[11]</sup>). The number of degrees offered online through MOOCs rose to 50, although fewer degrees have been launched in 2019 in comparison to 2018 (Class Central, 2019<sup>[11]</sup>).

MOOCs provide enhanced flexibility for learning, allowing individuals to sign up and follow courses generally for free, although students have usually to pay to obtain a certification. MOOCs are offered in a large number of areas, with business and technology representing more than 40% of courses covered in 2019, followed by social sciences (11%) and science (9.2%) (Class Central, 2019<sup>[11]</sup>). In addition, evidence from the first years of MOOCs suggests that MOOCs foster multi-disciplinarity as many individuals who enter a MOOC platform for one type of course are likely to continue with courses in different subjects (OECD, 2019<sup>[2]</sup>; Chuang, 2017<sup>[14]</sup>).

## Box 5.2. Experimental evidence on online learning

### Online learning environments

Evidence from the experimental research literature shows that blended learning environments, combining face-to-face and online activities, are more beneficial to student outcomes than courses delivered solely online (Escueta et al., 2017<sub>[15]</sub>). Focusing on a college course in microeconomics at a large public university in the Northeast of the United States, Alpert, Couch and Harmo (2016<sub>[16]</sub>) performed a randomised experiment assigning students to three types of instructional formats: classroom instruction, blended instruction and online instruction. Students who followed the blended instruction format performed on a par with those enrolled in classroom instruction, whereas students attending online learning only displayed significantly poorer learning outcomes.

### MOOCs

Experimental research on MOOCs has mostly examined ways to enhance participants' efforts and expand access to MOOCs, through behavioural and mind-set interventions (Escueta et al., 2017<sub>[15]</sub>). Such interventions have focused on “social comparisons” (that make students aware of the performance of other students), commitment devices to reduce procrastination<sup>3</sup> or reducing “social identity” threats<sup>4</sup> more likely to be experienced by students from more disadvantages backgrounds (Abdul Latif Jameel Poverty Action Lab, 2019<sub>[17]</sub>; Escueta et al., 2017<sub>[15]</sub>). Although the number of high-quality experimental evaluations related to MOOCs remains limited, most of the behavioural and mind-set interventions have been successful at enhancing persistence and completion rates (Abdul Latif Jameel Poverty Action Lab, 2019<sub>[17]</sub>).

Among these interventions, Kizilcec et al. (2017<sub>[18]</sub>) explore the role of “social identity” threat as a driver of the gap in MOOC enrolment and completion rates between more-developed and less-developed countries. Data from an initial survey suggested that individuals from less-developed countries were more fearful about being perceived negatively in MOOCs due to their nationality than those from more advanced economies. In addition, there is also a risk that individuals from less-developed countries perceive themselves as outsiders since many MOOCs are designed in the United States, or if they are aware of education or work-related stereotypes others may hold against them. Kizilcec et al (2017<sub>[18]</sub>) evaluate therefore the effectiveness of mind-set interventions<sup>5</sup> targeting the “social identity” threat on a sample of participants in a Stanford University and then in a Harvard University MOOC. Individuals from Egypt, India and Pakistan were over-represented among those from less-developed economies in the experiment. The intervention was successful at closing the gap between less- and more-developed economies in terms of MOOC persistence (measured as the number of course materials individuals had engaged with) and completion.

Source: Alpert, W.T., K.A. Couch and O.R. Harmon: (2016<sub>[16]</sub>), “A randomized assessment of online learning”, *American Economic Review*, <http://dx.doi.org/10.1257/aer.p20161057>; Escueta, M. et al. (2017<sub>[15]</sub>), “Education technology: An evidence-based review”, *NBER Working Paper*, No. 23744, <http://www.nber.org/papers/w23744>; Abdul Latif Jameel Poverty Action Lab (2019<sub>[17]</sub>), “Will technology transform education for the better?”, *J-PAL Evidence Review*, <https://www.povertyactionlab.org/sites/default/files/documents/education-technology-evidence-review.pdf>; Kizilcec, R. F. et al. (2017<sub>[18]</sub>), “Closing global achievement gaps in MOOCs”, *Science*, <http://dx.doi.org/10.1126/science.aag2063>.

Low completion rates have been one of the main challenges associated with the development of MOOCs. Data from the edX platform show that one in two individuals who register for MOOCs do not attend the course. In addition, new enrolments have been on a decline since 2016 and completion rates of those who have registered and viewed the course but did not ask for certification have remained at below 10% throughout the 2013-2018 period (Reich and Ruipérez-Valiente, 2019<sub>[19]</sub>). Online learning environments

have been shown to be less beneficial to learners than blended ones and behavioural and mind-set interventions have sought to enhance MOOC completion rates (Box 5.2). Most experimental evaluations of such interventions have found positive effects (Escueta et al., 2017<sup>[15]</sup>). At the same time, non-completion is not necessarily a problem in itself if individuals retrieve the information they need and acquire knowledge by following the course even if only partially. The objectives of MOOC participants are likely to be very different, from interest in a specific topic or desire to obtain a recognised certificate for employment opportunities (OECD, 2019<sup>[2]</sup>), translating into different incentives for completing courses. At the same time, MOOCs have also faced challenges related to the difficulty of recreating aspects of in-person learning experiences that are particularly valuable in the learning process (OECD, 2015<sup>[20]</sup>). Blended learning environments, which combine in person and online activities, appear to be more beneficial to student outcomes than purely online learning ones (Box 5.2).

When looking at the use of open and distance learning in Latin America, it is worth noting that MOOC enrolments have disproportionately come from countries rated very high on the Human Development Index (HDI)<sup>6</sup> and this pattern has remained relatively stable in the last decade (Reich and Ruipérez-Valiente, 2019<sup>[19]</sup>). MOOCs have managed to reach individuals from countries outside of the United States. For instance, in 2013, 29% of HarvardX-MITx viewers were from the United States and only around 7% came from Latin American and Caribbean countries (Figure 5.12).

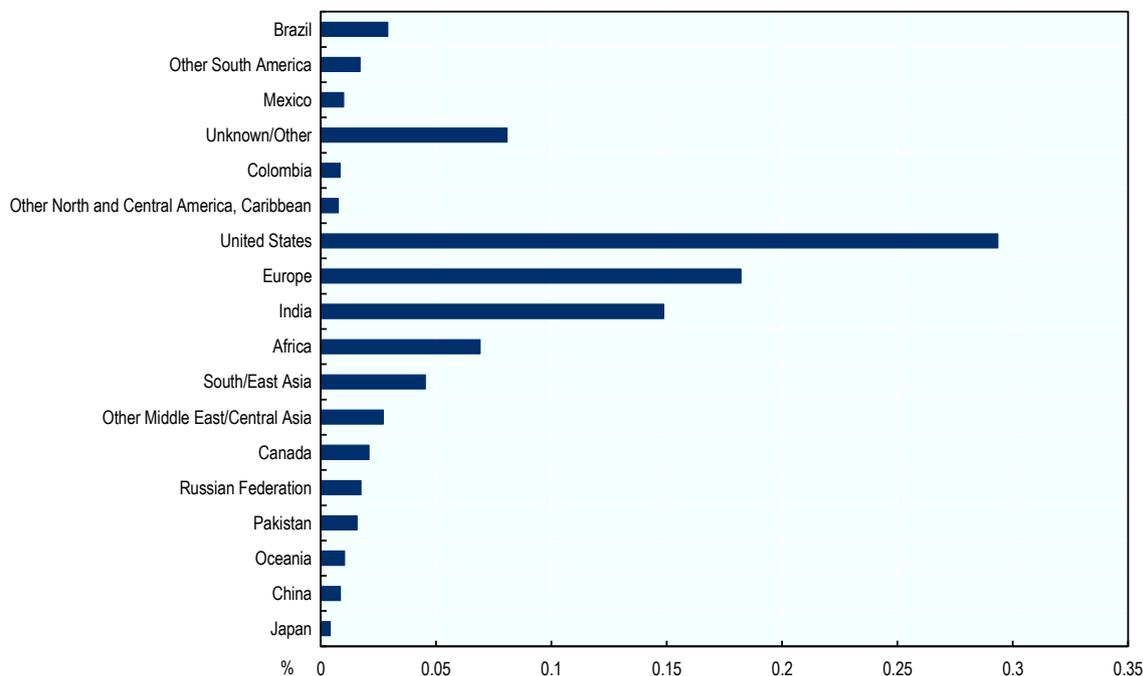
Nevertheless, on average between 2012 and 2018, 60% of MOOC enrolments have been represented by enrolments from countries with very high HDI, followed by an average of 20% of enrolments from countries with high HDI and another 20% from countries with medium HDI (Reich and Ruipérez-Valiente, 2019<sup>[19]</sup>). A large number of Latin American countries, including Brazil, Colombia, Costa Rica and Mexico, score 'high' in the Human Development Index, whereas only Argentina and Chile are rated as 'very high'. Latin American individuals have engaged in MOOCs but the number of enrolments likely remains below that of most OECD countries. The same patterns hold for MOOC certification rates that have been substantially higher in the most developed economies (Reich and Ruipérez-Valiente, 2019<sup>[19]</sup>).

In a similar vein to open education and standard forms of adult training, participation in MOOCs has tended to be higher among the highly skilled, highly educated and among individuals with higher socio-economic status. Data from 68 MOOCs run by Harvard and MIT in 2012-2014 and gathering more than 160 000 participants from the United States showed that most MOOC participants came from more affluent and better-educated neighbourhoods (Hansen and Reich, 2015<sup>[21]</sup>). Among participants, young individuals from high socio-economic backgrounds were more likely to obtain a certificate. In fact, most MOOC participants are around 30 years old (Music, 2016<sup>[22]</sup>). A different survey provided evidence that more than 70% of MOOC participants held a Bachelor's degree (Chuang, 2017<sup>[14]</sup>). As expected, having strong digital skills also enhances MOOC participation, suggesting that skills are an important source of divide in the use of and benefits that can be derived from new digital learning opportunities (Castaño-Muñoz et al., 2017<sup>[23]</sup>; Castaño Muñoz, Punie and Inamorato dos Santos, 2015<sup>[24]</sup>).

Latin American countries display a similar pattern of participation in MOOCs. Data from edX MOOC participants in 2012-2013 showed that in Latin America, most MOOC participants were very young (the median age of participants was 26 years old), mostly men (76%), holding a Bachelor or a Master's degree (more than 60% of participants) (Music, 2016<sup>[22]</sup>). Evidence from the MOOC programme of the Inter-American Development Bank (IDBx) between 2014 and 2017 provided a similar picture of participation skewed towards the younger, more-educated individuals (González et al., 2017<sup>[25]</sup>). However, subjects covered by IDBx were more specific as they focused on development-related topics and hence, were more likely to attract participation from individuals with higher levels of education (Box 5.3).

**Figure 5.12. MITx and HarvardX MOOC viewers in 2013**

Share of MOOC viewers, by country/region among all MOOC viewers



Source: Adapted from MITx And HarvardX (2014<sup>[26]</sup>), "HarvardX-MITx Person-Course Academic Year 2013 De-Identified dataset, version 1.0", <http://dx.doi.org/10.7910/dvn/26147>.

StatLink  <https://doi.org/10.1787/888934136212>

### Box 5.3. Evidence from the IDBx MOOC programme in Latin America

González et al. (2017<sup>[25]</sup>) provide evidence on MOOCs offered by the Inter-American Development Bank on edX. These MOOCs covered development-related topics (e.g. management for development results, sustainable development of cities, pensions).

As in the case of MOOCs provided by more general MOOC platforms, completion rates for IDBx were low (9% of enrolled individuals). Most MOOC participants came from Colombia, Peru, Mexico and Ecuador. Accounting for the size of the each country's economically active population displayed a different ranking, with Barbados, Costa Rica, Ecuador and Peru being top countries in terms of enrolment.

More than half of MOOC participants were aged between 26 and 39 years old and 70% had at least a Bachelor's degree. Given the type of topics covered by IDBx, most MOOC participants were development practitioners and 33% of them worked in the public sector. A survey ran on a sample of more than 6 000 learners showed that more than 90% of survey respondents considered the MOOC to have had a positive impact on knowledge and skills for their current job.

Source: González, E. et al (2017<sup>[25]</sup>), *A Glimpse on How MOOCs from IDB are Impacting Learners in Latin America*, *Proceedings of the International Conference MOOC-MAKER 2017, Antigua Guatemala, Guatemala, 16-17 November 2017*, <http://ceur-ws.org/Vol-1993/7.pdf>.

The initial promise of MOOCs has revolved around the expansion of access to education and learning for those who would otherwise not engage in higher education or adult training (Reich and Ruipérez-Valiente, 2019<sup>[19]</sup>) or who could only access education or training of low quality.<sup>7</sup> Nevertheless, the provision of MOOCs has progressively shifted from a model based on free online courses to the delivery of micro-credentials and increasingly, paid fully online degrees (Shah, 2018<sup>[27]</sup>). This development is likely to benefit even more those who have the resources and the skills to engage in such programmes. There is still scope for MOOCs to reach less-skilled individuals or outsiders of formal education systems who would mostly benefit from additional training opportunities brought by new technologies. Policies that develop individuals' access to high-quality ICT infrastructure and digital competence are first steps in supporting the expansion of access to participants who may lack the resources and computer skills to be able to access MOOCs. Behavioural interventions have been shown to be successful at enhancing MOOC efforts and completion (Box 5.2), thereby increasing the motivation, the chances of success and therefore the attractiveness of MOOCs for those in search of additional training opportunities. In a similar vein, the provision of MOOCs in a larger number of languages allows reaching a larger audience.

The availability of data and information on MOOCs effectiveness and quality would equally support an expansion in participation, for instance, by facilitating the use of MOOCs by companies to train their workers. Evidence on the effect of MOOCs on skills development is still lacking, especially since individuals take MOOCs for different reasons and the exact role MOOCs play relative to other forms of education provision is difficult to establish (Escueta et al., 2017<sup>[15]</sup>). Survey data tend to show that many employees see MOOCs as a useful tool to develop skills for their current job (Hamori, 2018<sup>[28]</sup>; Gonzalez Vazquez et al., 2019<sup>[29]</sup>), but the potential of MOOCs for employee professional development remains to be further exploited (OECD, 2019<sup>[2]</sup>). A close collaboration between governments, social partners, MOOC platforms and education and training providers is needed in order to better assess the quality of MOOCs and facilitate the recognition and certification of skills acquired through MOOCs (OECD, 2019<sup>[2]</sup>). Online certificates, badges, portfolios, nanodegrees are only a few examples of the many certification opportunities brought about by new technologies. Making certification easier and more accessible, as well as enhancing support participants receive while they engage in MOOCs can further enhance individual incentives for participating in this type of learning activity. In addition, defining standards and good practices for certification, and integrating acquired certificates in national qualification frameworks can also enhance the recognition and certification of skills acquired through digital learning opportunities (OECD, 2019<sup>[2]</sup>).

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## Notes

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<sup>1</sup> Similar results are found for other emerging economies such as Turkey and the Russian Federation.

<sup>2</sup> For Latin American countries, participation in open or distance education is likely to capture also adults' participation in MOOCs. The OECD Survey of Adult Skills (PIAAC) collected data in three rounds, with most OECD countries being surveyed in 2012, while Latin American ones being surveyed in 2015 (Chile) and 2017 (Ecuador, Mexico and Peru). It is likely therefore that data from later rounds of the survey also reflect participation in MOOCs, whereas in 2012, MOOCs were only in their early stages (OECD, 2019<sup>[2]</sup>).

<sup>3</sup> MOOC followers are more likely to procrastinate since an instructor is not following them. Patterson (2018<sup>[30]</sup>) examines the effect of commitment devices making students pre-commit to time limits in Internet activities that could be distracting for them. Students who had the commitment device devote 24% more of their time to working on the course in comparison to students in the control group.

<sup>4</sup> Kizilcec et al. (2017<sup>[18]</sup>) define social threat as the “fear of being seen as less capable because of one’s group”.

<sup>5</sup> Mind-set interventions are interventions that target “students’ attitudes, beliefs, and dispositions as key factors that can support or inhibit student success” (Snipes and Tran, 2017<sup>[32]</sup>) in order to enhance student outcomes (Escueta et al., 2017<sup>[15]</sup>).

<sup>6</sup> The Human Development Index is a composite index based on indicators of life expectancy, education and per capita income indicators.

<sup>7</sup> For instance, Colombia has a relatively large number of low-quality private “garage universities” attended mostly by disadvantaged students (OECD, 2019<sup>[31]</sup>).



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