

1 Overview

Societies around the globe are rapidly changing and digitalisation is bringing challenges as well as opportunities for learning and skills development. In Latin America, reducing digital divides and boosting Internet adoption is a first step to making the most of learning opportunities brought about by new technologies. That is not enough: new technologies should be integrated more efficiently in initial education by, for instance, providing high quality and comprehensive training to teachers. In turbulent post COVID-19 times, in Latin America as in other countries, there is also scope to further harness the potential of open education and MOOCs in reaching adults most in need of training.

Digitalisation transforms the world of work and societies, while it also brings many opportunities for learning and skills development. Latin American countries are lagging behind OECD economies with respect to the skills of their populations but digital technologies can be part of the solution. From initial to higher education and adult training, new technologies open the door to innumerable learning activities, available at any time, from anywhere and to anyone. In schools, the use of new technologies can support the development of 21st century skills, facilitate the deployment of innovative learning practices and personalise learning to engage students who are at risk of being left behind. For adults, digital resources expand opportunities to acquire knowledge and develop skills flexibly, at any point in life, for job-related purposes or just for the pleasure of learning.

Boosting connectivity and Internet adoption is a first step to make the most of learning opportunities brought about by new technologies in Latin America

Although the lack of connectivity is an obstacle for technology-driven learning in Latin America, this is not the only factor. The lack of skills and digital competence, as well as security and affordability-related challenges remain Latin America's most relevant barriers for Internet adoption. To ensure that Latin American individuals have the possibility to make the most of new technologies for learning and training, enhancing connectivity is only the first step.

Countries in the region need to help individuals strengthen their skills to engage in rapidly changing world of work and societies.

- Only less than 10% of individuals in Chile, Ecuador, Mexico and Peru have a well-rounded level of literacy, numeracy and problem-solving skills in technology-rich environments and around 42% of Latin American 15-year-olds who participated in the Programme for International Student Assessment (PISA) in 2018 are low performers in science, reading and mathematics. In the Dominican Republic, this share goes up to 75%.

Digital divides or inequalities in the access, use or benefits derived from the use of information and communication technologies (ICT) are still obstacles for learning with new technologies in Latin America.

- Penetration of broadband services is low relative to levels observed in OECD countries. In 2017, penetration of mobile broadband was, on average, of 64.9% in Latin American countries in contrast to 102% for OECD countries. Penetration of fixed broadband was just above 12% in contrast to more than double (30%) in OECD countries. Some Latin American countries, together with Asia and Africa, also fare poorly in terms of average Internet connection speed relative to OECD countries. Inequalities also persist across and within countries in the region in individuals' access and use of digital technologies by socio-economic status, gender, age and territory.

Public institutions and in particular schools can play a leading role in bringing individuals and young people on line.

- Connectivity remains a challenge for the overall population in Latin America, but this is less so for students as public institutions and, in particular, schools are helping to bridge this divide. Around 75% of students in the region reported having access to a computer, desktop or laptop in their school and a similar share to have an Internet connection.
- Schools in many Latin American countries play an important role in bringing connectivity to ICT to many disadvantaged students who would otherwise be left disconnected. Around 25% of socio-economically disadvantaged students in Latin American countries have access to a computer only when at school and 16% of them are able to go on line exclusively when at school, lacking the chance to connect when at home. In Peru, almost two-thirds have access to a computer solely in the school premises and more than one-third of students have Internet access only at school.
- In Colombia, Mexico and Peru, schools act as Internet providers for more than 20% of rural students who lack access at home but who can go on line at school. Schools, more generally, also play an important role in making computers, and not only connection to the Internet, available for rural students in those same countries. For instance, more than 41% of rural students in Peru have access to a desktop/computer/tablet only at school. In Colombia, this is the case for 20% of rural students and in Mexico for 27% of them.

Socio-economic background plays an important role in students' access to technology in Latin America, leading to divides that policy makers should address.

- Around 18% of Latin American 15-year-olds from socio-economically disadvantaged backgrounds lack an Internet connection at home and at school, in contrast to less than 2% on average in OECD countries. Some 24% of them, in addition, do not have access to a computer (desktop, laptop or tablet) neither at home, nor at school. In contrast, computer access of socio-economically advantaged students in Latin American countries is comparable to that of students in OECD countries: in Latin American and OECD countries alike, less than 1% of socio-economically advantaged students lack access to a desktop, laptop or tablet. Important divides persist between advantaged and disadvantaged students and need urgent policy intervention to make the digital revolution truly inclusive across the countries of the region.
- The extent to which disadvantaged and advantaged students are able to connect varies widely across countries in the region. Among countries with available data, the digital divide between advantaged and disadvantaged students is especially large in the Dominican Republic, Mexico and Peru. One-third of disadvantaged students in the Dominican Republic are not able to connect to the Internet and 40% of them lack access to a computer.

Relative to other potential barriers, shortage or inadequacy of digital technology for instruction (e.g. software, tablets, computers, smart boards) and insufficient Internet access are very often reported to be important challenges hindering instruction in Latin America schools.

- Much needs to be done to put teachers and schools in a position to make the most of the digital revolution for learning and teaching activities. In particular, some 51% of principals, on average in the region, report insufficient Internet access as a barrier and around 43% of principals in the region complain about the shortage or inadequacy of digital technology for instruction.

In Latin America, new technologies should be integrated more efficiently in initial education

All Latin American countries display shares of low-performing students well above the OECD average and new technologies can bring opportunities to enhance student outcomes.

Addressing connectivity is crucial, but it is not enough to improve learning or academic outcomes and in Latin America, the use of technology for learning and skills development has not reached its full potential yet. Integrating technology innovatively in teaching and learning practices is crucial and Latin American teachers play a pivotal role in realising the untapped potential of new technologies in initial education.

When technology is blended into innovative teaching and learning practices, it can enhance student performance. To be successful, however, digital technologies need to be introduced into schools as part of a comprehensive approach that aligns technology use with curricular needs, and includes teacher training and ICT support. This sort of comprehensive approach is essential to ensure that innovative uses of new technologies support teaching and learning practices.

- Technology use should not be the objective but rather a tool to leverage more innovative pedagogies. Simply delivering content through technology, substituting teaching by using computers or reproducing traditional pedagogies using ICT is unlikely to result in better outcomes. The way technology is integrated in teaching and learning activities is crucial to enhance student outcomes, and when these pre-conditions are missing, students' performance may not improve or even be hindered. Gamification, flipped instruction or blended learning are some examples of innovative practices that can rely on digital technologies and show great potential for improved learning. Teachers in Latin American countries with available data report high levels of openness to innovation in their school, similar to those observed among OECD countries, and hence of readiness to adopt new technologies in schools. Most teachers, in between 71% in Chile and up to 80% in Brazil, report being open to change and similar shares also declare to search for new ways to solve problems in the classroom.
- A comprehensive approach is needed to make the most of new technologies in initial education in Latin America. Teachers are a cornerstone of this approach. Accounting for curricular needs and teachers' objectives is key when introducing digital technologies in schools. Similarly, providing ICT support and high-quality training to teachers on both 'when' and 'how' to integrate technology in their teaching are essential to ensure that technology is used at its best potential in the classroom. Those digital tools that reach schools and classrooms need to be of high quality, carefully designed and tailored to benefit teaching and improve student learning. In many Latin American countries, there is still scope for a more efficient and innovative integration of digital technologies in teaching and learning practices to allow everyone to reap the benefits stemming from the digital revolution.

Providing high quality and comprehensive training to teachers is crucial to make the best out of new technologies for teaching and learning

Integrating technology in innovative teaching and learning practices is crucial and Latin American teachers play a pivotal role in realising the untapped potential of new technologies in initial education.

Training in ICT skills for teaching, teacher self-efficacy and collaboration with other teachers matter for teachers' use of ICT in class and their self-efficacy in supporting student learning using digital technologies.

- Whether in Latin American or OECD countries, teachers' use of ICT in class and self-efficacy in supporting student learning using ICT relate strongly to their training in ICT skills for teaching. Merely receiving training in the use of ICT for teaching in their initial education is not sufficient to enable teachers' use of ICT in their classroom and their self-confidence in supporting student learning through digital technologies. What drives Latin American teachers' use of ICT is how well prepared they actually felt after receiving training. Participation in professional development in ICT skills for teaching seems, also, to be very important.
- Teachers who feel more efficient about their instruction are more likely to let their students use ICT frequently for learning activities and feel more confident about their capacity to support learning using new technologies. In addition, the likelihood that teachers let their students use ICT frequently also increases with teachers' degree of collaboration with other teachers.

Many Latin American teachers use technologies in the classroom and receive training in ICT skills for teaching.

- In Latin American countries with available data in TALIS (2018), many teachers frequently use technology in the classroom and feel quite confident about their capacity to support student learning through ICT use. Latin American teachers seem to use ICT in class with relatively higher frequency than their OECD counterparts. However, these data do not allow knowing how technology is integrated in teaching practices. In addition, teachers' self-efficacy in ICT use for student learning is based on self-evaluative questions and replies may reflect the opinion of teachers about what they think it is expected from them rather than an objective assessment of their capacity to effectively integrate digital technologies in the classroom.
- More than 70% of teachers in Latin America let their students use ICT frequently or always for projects or class work. Aggregate results hide, however, large disparities within the region. In Brazil, only 41% of lower secondary teachers display a high frequency use of ICT in class and one in five teachers never relies on ICT for class work.
- Many Latin American teachers report having received training in the use of ICT for teaching as part of their initial teacher education or training. In Chile, Colombia and Mexico, more than 70% of lower-secondary teachers report having trained in the use of ICT for teaching during their initial teacher education. Similarly, many report having engaged in professional development activities to develop their ICT skills for teaching. Colombia displays one of the largest shares of teachers who have engaged in professional development in ICT skills for teaching in the year prior to the survey (78%).
- In addition, a relatively high share of teachers in Latin American countries train through technology. On average, around 40% of Latin American lower-secondary teachers have participated in online courses or seminars as part of their professional development activities.

Teachers' training needs in ICT skills for teaching remain high, raising the need to revisit how teachers are trained for teaching with new technologies.

- As many as 60% of Latin American teachers report the need for further professional development in ICT skills for teaching and for 22% the need is substantial. Even when they already received training in ICT skills for teaching in the year prior to the survey, a relatively large share of Latin American teachers still report high levels of need in professional development.
- In Colombia, the level of self-reported need for further training in ICT is much larger than in the majority of OECD countries, irrespective of whether teachers have already participated or not in professional development activities in ICT skills for teaching. In Brazil and Buenos Aires (Argentina), more than 30% of lower-secondary teachers did not participate in ICT-related professional development activities and report a high level of need in this area.
- Spending on high-quality professional development for teachers is considered a highly important spending priority for many more Latin American teachers than for OECD ones, pointing to the need to reinforce quality, more than quantity of teachers' training. In particular, in a scenario where the education budget were to increase, 86% of Latin American teachers consider that spending on the provision of high-quality professional development would be of high importance. Evidence suggests that in many Latin American countries, the accessibility and quality of professional development programmes should be a major focus for policy intervention.
- Teachers in Latin American countries with available data in the OECD Survey of Adult Skills (PIAAC) perform poorly in problem solving in technology-rich environments. Across the countries participating in the OECD Survey of Adult Skills (PIAAC), the share of teachers with low problem solving skills in technology-rich environments varies from less than 5% in Australia to around 54% in Ecuador. Teachers' skills relate to student performance. Substantial gains in students' performance could be obtained by strengthening teachers' skills and this should become a priority for Latin American governments.

There is scope to further harness the potential of open education and MOOCs in reaching adults most in need of training

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 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.

The COVID-19 crisis has shown the importance and potential of online learning for adults. 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 (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 aged 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 and 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).



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