

Towards Education 4.0: 10 Modules for the Implementation of Hybrid Models

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TOWARDS EDUCATION 4.0:

10



**MODULES FOR
THE IMPLEMENTATION
OF HYBRID MODELS**

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Prologue

The COVID-19 pandemic has revealed a level of inequity in access to technology and connectivity that we could never have foreseen. The programs implemented in Latin America and the Caribbean countries in recent years and the mass provision of devices, in which hundreds of millions of dollars have been invested, led us to suppose that, despite some critical reports including those of the Inter-American Development Bank (IDB), the situation was better than we observed during the pandemic. The reality has been revealed in all its crudeness: most Ibero-American students, especially those from low-income families and at risk of dropout - that is, around 50% of the population - lack connectivity and appropriate technology, creating a digital gap that is, in turn, reflected in an educational gap with very serious consequences for social inequality and poverty.

In recent decades, Ibero-America has faced and, to a large extent, overcome the challenge of quantitative educational objectives. We had to universalize education, and, for this, it was necessary to meet targets for access and coverage. This led to the postponement of qualitative goals, such as quality standards, equity and inclusion, that are still pending today. Now, we face again the need to meet quantitative objectives: to ensure access and coverage for everyone but, this time, as regards digitization and technology.

We do not have to start over. The challenge is very different today. It is no longer a matter of building schools or hiring millions of new teachers; the task is far more qualitative and profoundly transformative: we must install our education systems in the new digital society, providing essential connectivity and technology for all students equally, regardless of their social origin and whether they are at a public or private school. This must also be accompanied by new teaching methodologies, digital and audiovisual content, innovative school management systems and teachers who have new skills and, most importantly, a strong commitment to this new education.

We must not and cannot fall prey to the inertia of a past that takes us back to the situation before March 2020, characterized by the existence or, in some cases, survival of education systems that were low on efficiency and high on inequity. We must look to a different future that helps us to emerge from the crisis, recover students' learning and heal wounds - goals we can only achieve by doing things differently and for which technology and digitization offer the greatest support.

We face an enormous task that cannot be addressed in isolation or, worse still, without coordinating efforts and building alliances, as established in the 2030 Agenda's Sustainable Development Goal N°17. This is the spirit of the agreement signed by the IDB and the OEI, two leading organizations in the region, which have decided to join forces in an ambitious initiative to help Ibero-American ministries ensure the digitization of their education systems.



We are confident that this association will contribute to the achievement of sustainable development and equitable and high-quality education throughout the region. This collaborative work and cooperation will address the threat of the pandemic by focusing on such important pillars as the expansion of learning models, new pedagogical practices, the reinforcement of competencies and the development of digital skills as well as other key issues such as equipment and connectivity, platforms and curricular content and teacher training.

In short, it is a challenge and a commitment whose objective is to continue increasing investment in education by multilateral organizations and banks, together with governments, private companies and other civil society organizations, in order to incorporate innovative technological solutions for education in the digital age and, in this way, respond to the urgent task of recovering the learning of all those who have been without school, avoiding massive dropouts and building a face-to-face and digital educational future that offers more and better learning opportunities and well-being for all.

Mariano Jabonero

Secretary General of the Organization of Ibero-American States (OEI)



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A. Introduction

School closures in the face of the COVID-19 pandemic have forced countries around the world to address the challenge of emergency remote education. In Latin America and the Caribbean (LAC), the measures taken to prevent the spread of the virus pushed the education ministries to close schools and, as of March 2020, more than 165 million students were without face-to-face education (UNESCO, 2020a).¹ In February 2021, almost a year after the start of the pandemic, LAC continued to be the region most affected by school closures, with the loss of an average of 158 days of face-to-face education and 114 million students without in-person schooling ([UNICEF, 2021](#)).

In 2021, as they gradually reopen schools, many countries have begun to explore hybrid education in its many different forms, as a strategy for ensuring learning continuity. As well as serving as a key support for gradual school reopening in the context of a pandemic, hybrid models, which incorporate technology in education and use remote learning experiences, can be great allies in overcoming the main challenges faced by education systems.

There is no doubt that the effects of the educational crisis caused by COVID-19 will be devastating and it is necessary to activate strategies for educational recovery in the short term. However, to capitalize on the lessons learned from emergency remote education and take advantage of the accelerated digitization to transform education in line with the needs of the twenty-first century, it is also necessary to look to the medium and long term and begin to lay the foundations of a transformation of education in LAC.

In this context, hybrid education models offer opportunities to improve access to education and its quality, narrowing the learning gaps, that have been exacerbated by the pandemic. Hybrid models can, for example, increase the system's ability to enable students to learn at their own pace, facilitating self-managed learning experiences and, in this way, provide them with key skills for stimulating learning. In addition, hybrid models serve as a catalyst for the digital transformation of education

1. Includes Argentina, the Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, the Dominican Republic, Suriname, Trinidad and Tobago, Uruguay and Venezuela. Information from the UNESCO Institute for Statistics as of May 1, 2020 (<https://en.unesco.org/covid19/educationresponse>).



since they offer an opportunity to transform ways of learning and teaching, promoting models that are more flexible, more inclusive and geared to the development of the skills and competencies of the twenty-first century, which will be essential for the jobs of the future (Arias Ortiz et al., 2020).

With this in mind, hybrid education should not focus only on alternating face-to-face education with technology-mediated distance education, but should also promote a more effective classroom use of the learning possibilities offered by digital tools, taking greater advantage of technology to create student-centered experiences that are personalized, relevant and attractive (Arias Ortiz et al., 2020). However, the quest to make effective use of hybrid education models and harness the opportunities they offer entails important challenges. How can we ensure they do not widen learning gaps in a region with great inequalities in access to connectivity and technological devices? How can we prepare teachers to make effective use of digital tools and improve the quality of learning? How can we promote real changes in ways of learning and teaching and better prepare the region's children and young people for the jobs of the future?

In this sense, the region faces great challenges related to both the supply and demand of hybrid education.² Supply implies not only making programs, resources and tools available, but also having teachers trained in new pedagogical practices and the use of technology, as well as curricula adapted to support and promote these new skill-based ways of learning. In the case of demand, the main challenges lie in access to technological devices and connectivity and their use, which are essential to maximize the experience of hybrid education.

Faced with the pandemic, LAC countries were poorly prepared for the adoption of digital solutions as a means of providing educational continuity during the crisis (Álvarez Marinelli et al., 2020). Most lacked digital tools and resources, such as digital platforms, virtual tutorials, packages of digital resources or central content repositories, essential to support school teaching processes. The situation was even more complex considering the difficulties in access to connectivity and devices. According to data from PISA 2018, only 64% of students had access to a computer at home and only 77% had connectivity at home (Rieble-Aubourg and Viteri, 2020). Beyond these low percentages, the greatest challenge lay in inequalities: only 29% of vulnerable students had access to a computer and only 45% to Internet at home while, in the case of advantaged students, access was practically universal (98% for a computer and 94% for an Internet connection) (Rieble-Aubourg and Viteri, 2020).

2. The regulatory and investment dimensions are also essential for the development of hybrid education models, but fall outside the scope of this technical note.



In response to the need to provide emergency remote education, countries in the region made great efforts - albeit with widely differing results - to guarantee learning continuity, attempting to ensure an appropriate supply of tools and solutions for distance education (such as educational platforms, LMS, educational portals with digital content, printed material and educational content for television and/or radio). They also took measures to expand demand and access for students, acquiring tablets or computers and making arrangements to widen access to connectivity. Although the region still has a long road ahead before it can guarantee the conditions required for the effective implementation of hybrid models, there is no doubt that the measures adopted during the pandemic have given a great boost to the development of future hybrid education models.

A third dimension for the implementation of effective hybrid models, in addition to the basic conditions in terms of supply and demand, is the strategic and efficient planning of the distribution of activities between face-to-face and remote teaching time (Arias Ortiz et al., 2020). This implies considering the dimensions of time, space and interaction in order to design the subjects, activities and approaches appropriate to each of these learning spaces and ensure pedagogical consistency between them (Barron et al., 2021).

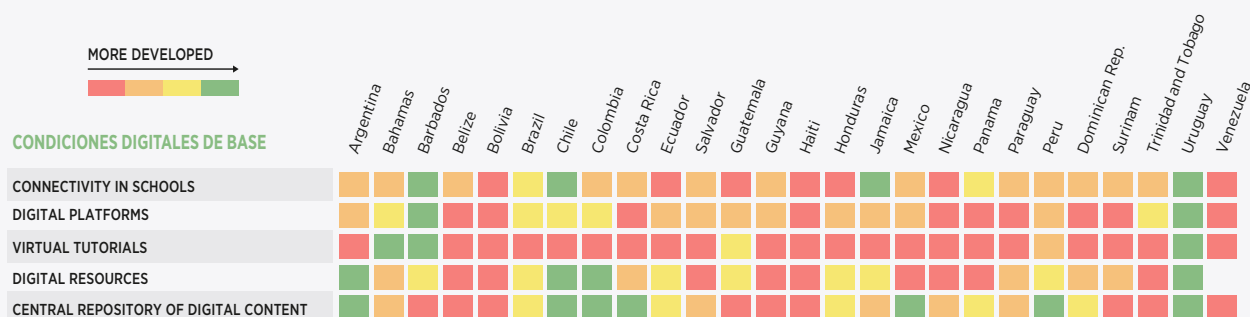
This technical note seeks to contribute to the implementation of hybrid education models in LAC from a practical standpoint anchored in the regional context, capitalizing on experiences of remote and hybrid emergency education and fostering educational improvement and the digital transformation of education systems. To this end, it presents a flexible modular implementation framework that can be adapted to the different realities and contexts that coexist in the region.

B Remote and hybrid emergency education during the pandemic

Remote emergency education to ensure learning continuity

Before the pandemic, very few countries had digital tools and resources to support the school teaching process and were, therefore, poorly prepared to provide digital solutions during the crisis (Álvarez Marinelli et al., 2020). Figure 1 shows a summary of the level of development of digital conditions for education with which LAC countries had to face school closures and emergency remote education. The level of development was generally low, but with important differences between countries.

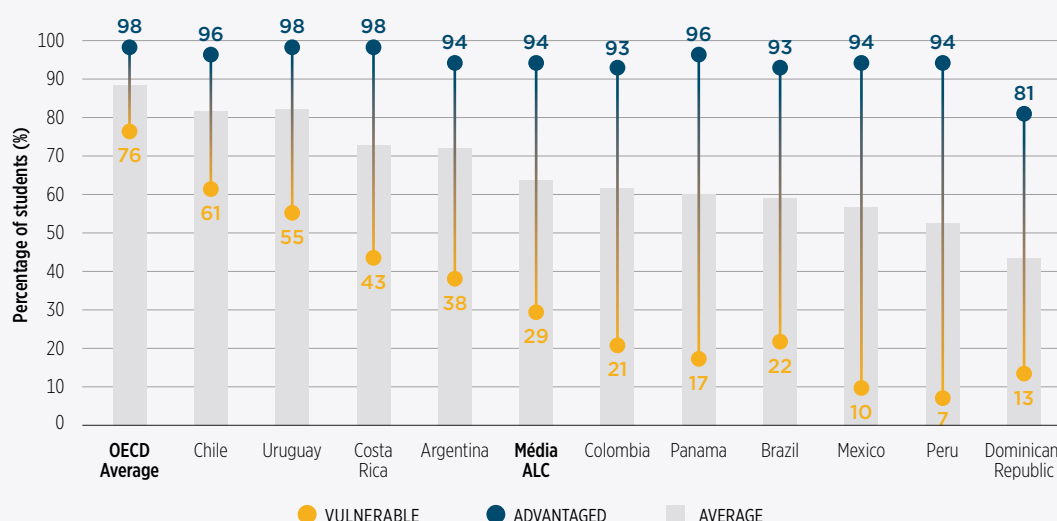
FIGURE 1 ► DIGITAL CONDITIONS IN LAC BEFORE THE PANDEMIC



Source: SIGED and data gathered by the IDB's Education Division.

Moreover, access to devices and connectivity at home was low, with great inequalities depending on both socioeconomic level and geographic area (rural or urban). PISA 2018 shows that, in LAC, an average 64% of students had access to a computer at home for schoolwork, with a gap of 65 percentage points between the advantaged and vulnerable students³ (Figure 2) (Rieble-Aubourg and Viteri, 2020).

FIGURE 2 ▶ ACCESS TO A COMPUTER AT HOME BY SOCIOECONOMIC LEVEL, PISA 2018

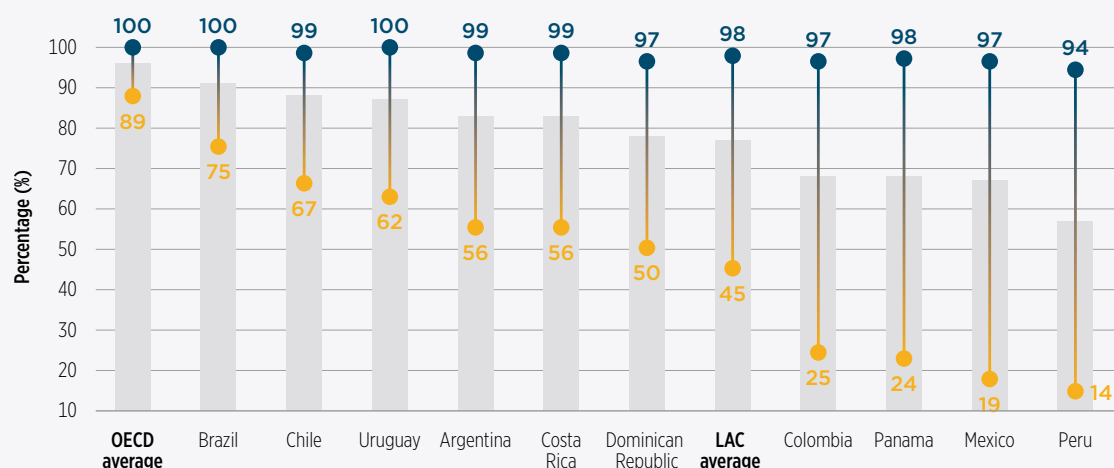


Source: Rieble-Aubourg and Viteri (2020).

In LAC, an average 77% of students have access to connectivity at home as compared to 96% in member states of the Organisation for Economic Co-operation and Development (OECD) (Rieble-Aubourg and Viteri, 2020). The urban-rural gap is one of the main reflections of inequity in access to Internet in LAC, with the largest differences observed in Panama, Peru, Colombia and Mexico (more than 25 percentage points) (Rieble-Aubourg and Viteri, 2020). There are, in addition, inequalities by socioeconomic level: access in the case of vulnerable students reaches 45% compared to 98% for advantaged students (Figure 3) (Rieble-Aubourg and Viteri, 2020).

3. Access to a computer at home for school work does not necessarily imply its availability and unlimited use for this purpose since it may have to be shared with other members of the household.

FIGURE 3 ▶ ACCESS TO INTERNET AT HOME BY SOCIOECONOMIC LEVEL, PISA 2018



Source: Elacqua et al. (2020).

As well as access to Internet, bandwidth and speed are also important for online learning (Reimers and Schleicher, 2020). In this area, the region has challenges in terms of both the quality and speed of connections. The Substantial Connectivity Index⁴ applied to seven LAC countries shows that, on average, 29% of the urban population and 63% of the rural population lack access to a connection in line with substantial connectivity standards (Ziegler et al., 2020). Data from the [DigiLAC](#) platform on fixed broadband speed indicates an average of 59.71 megabytes per second (Mbps) in LAC compared to 141.86 Mbps for OECD countries or, in other words, practically twice as fast. In the case of 4G mobile networks, the average speed for LAC is 47.13 and 100.57 for the OECD.

Faced with the imminent closure of schools due to the health crisis, LAC countries needed to take measures to support learning continuity. The solutions and strategies they deployed to guarantee remote education, as well as the measures they took to improve demand and ensure access to devices and connectivity, were dissimilar (Table 1). Depending on their existing capacity and particular challenges, they selected different strategies (such as educational platforms, LMS, educational portals with digital content, printed materials and educational content for television

4. The concept of substantial connectivity comprises the elements required for basic analysis of its quality, considering not only whether a person has access to Internet, but also the regularity and quality of the connection. This concept is based on four fundamental pillars or dimensions and defines minimum standards: i) regular use of Internet (people have regular and permanent access to Internet); ii) an appropriate device (people have the necessary devices to connect as needed); iii) sufficient data (people have permanent access to sufficient data to carry out daily activities); and iv) adequate connection speed (connection speed is adequate to satisfy demand) (Ziegler et al., 2020).

and/or radio). As a result, response to the pandemic was heterogeneous, both between and within countries, and students' educational experiences during the pandemic have also been diverse (Mateo-Berganza, 2021a).

TABLE 1 ► EDUCATIONAL SOLUTIONS AND MEASURES TO IMPROVE
DIGITAL CONDITIONS IN LAC

	Argentina	Bahamas	Barbados	Belize	Bolivia	Brazil	Chile	Colombia	Costa Rica	Ecuador	Salvador	Guatemala	Guyana	Haiti	Honduras	Jamaica	Mexico	Nicaragua	Panama	Paraguay	Perú	Dominican Rep.	Suriname	Trinidad and Tobago	Uruguay	Venezuela
DISTANCE EDUCATION SOLUTIONS																										
Math exercises platform aligned with curriculum																										
Reading exercises platform aligned with curriculum																										
Learning Management Systems (LMS)																										
Communications platforms																										
Assessment platforms																										
Educational portals with digital content																										
Physical material or social networks																										
Television or radio																										
MEASURES TO IMPROVE DIGITAL CONDITIONS																										
Acquisition of tablets or computers to expand access to devices																										
Arrangements to expand access to connectivity																										

Source: Compiled by authors based on data gathered by the IDB's Education Division.

Note: Last updated on February 26, 2021.

Some countries have developed a comprehensive strategy based on the set of educational platforms, LMS, communications and assessment platforms and content repositories, while others have focused on the development of physical materials, materials for television or radio and educational portals with digital content. It is worth noting the differences observed within countries where factors such as socioeconomic level or conditions of remoteness have produced heterogeneous impacts (Mateo-Berganza, 2021a).

A key dimension of the policies and strategies implemented to guarantee educational continuity is their scope. Data from a survey conducted in Brazil by UNDIME and CONSED, which analyzed 71% of the country's municipalities, shows that, as of May 2020, 40% of municipalities did not have a distance education plan. In addition, a survey by Datafolha of families of students enrolled in public schools found that, as of July 2020, 18% of students had not received any type of distance education, affecting mainly primary students and, in particular, those in municipal schools in poor areas (Arias Ortiz et al., 2021). The fourth wave of the Datafolha survey, carried out in September



2020, found that the percentage of students without access to any type of distance education had dropped to 8%, but with large geographical differences: 16% in the north of the country and 4% in the south (Arias Ortiz et al., 2021). The PNAD COVID-19 survey, carried out by the Brazilian Institute of Geography and Statistics (IBGE), showed that the poorer the student, the lower the student's school frequency, the number of exercises received, and the time dedicated to these exercises, implying that the poorest students were 633% more affected by the lack of school activities than the richest students (Neri and Osorio, 2020).

A slower-than-expected and more gradual transition to hybrid and face-to-face education

Over a year after the start of the pandemic, several LAC countries have gradually begun to reopen schools but very few have their schools fully open (Map 1). For the start of the return to face-to-face classes, most education systems have preferred hybrid models in order to comply with health protocols for a safe return (Berlanga et al., 2020). In this context, the option of implementing hybrid education has been a priority as a way of ensuring educational continuity and avoiding greater learning gaps and lags.

MAP 1 ► PHYSICAL REOPENING OF SCHOOLS IN LATIN AMERICA AND THE CARIBBEAN, APRIL 2021

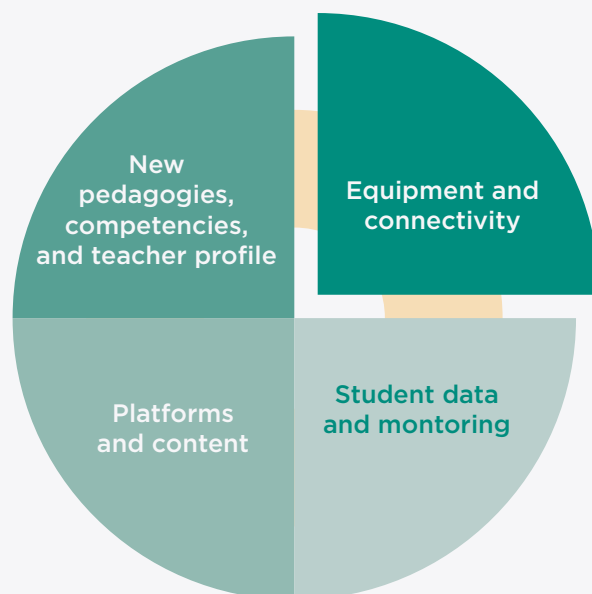


Source: Compiled by authors based on data gathered by the IDB's Education Division.

At the beginning of the pandemic, the reopening of schools and the corresponding forms of learning were visualized as a series of sequential phases: i) emergency remote education while schools were closed; ii) hybrid education during the reopening process; and iii) complete face-to-face reopening. However, reality has shown that these phases are not necessarily sequential and, instead, education systems pass through different combinations of remote, hybrid and face-to-face education, depending on the evolution of the virus and the health measures established by each country or community. In this sense, the challenge has been greater since reopening plans have had to be flexible, adapting to the health situation in terms of community transmission rates and the detection of cases of COVID-19 in schools, with the possibility of a renewed suspension of face-to-face classes (Berlanga et al., 2020).

The publication “Education Policy Brief #2: Four Key Elements to Make Hybrid Education a Reality” (Arias Ortiz et al., 2020) presents a conceptual framework for the design and implementation of hybrid models in the context of the COVID-19 pandemic (Figure 4). Based on existing evidence for the use of technology in education and new experiences during the school closure, it identifies four key pillars: i) new pedagogies, competencies and teacher profile; ii) equipment and connectivity; iii) platforms and content; and iv) student data and monitoring.

FIGURE 4 ► THE FOUR PILLARS OF HYBRID EDUCATION



The pillar of *new pedagogies, competencies and teacher profile* draws attention to the importance of building experiences that capture students’ interest in learning, using technology in the framework of a new pedagogical model that seeks to develop students’ autonomy in learning and use of time and focuses on the development of socio-emotional competencies and skills. This calls for the definition of effective models for the development of teachers’ competencies and skills to enable them to teach within the framework of this new model.

The pillar that refers to *equipment and connectivity* is essential to guarantee that hybrid education models do not replicate existing inequalities and educational gaps. Access to devices and connectivity, for both students and teachers, in schools and at home, is key for the implementation of an inclusive hybrid model.

As regards *platforms and content*, priorities must be established in the curriculum (mathematics, reading and writing, twenty-first-century skills) and greater flexibility must be introduced, strate-



gically defining the activities and content that should be developed in each of the learning spaces (face-to-face and remote). In addition, until universal access to connectivity and devices can be guaranteed, it will be necessary to combine digital and analog channels in order to reach the most vulnerable students.

Finally, the pillar of *student data and monitoring* focuses on the importance of establishing mechanisms to monitor and evaluate learning, harnessing the advantages afforded by technology to improve and/or adapt the offer of content and create systems to protect educational pathways that meet students' needs and demands. It also underscores the importance of using Education Management and Information Systems (SIGEDs) to provide an integral overview for the development of hybrid models and guarantee their efficient management.

These four pillars, drawn up and proposed in the context of school closures, were designed to serve as a guide for the design and implementation of hybrid models during the COVID-19 pandemic. Now, it is necessary to look beyond the pandemic, considering hybrid education models as an opportunity to improve the quality and equity of learning, accelerate the digital transformation of education and promote Education 4.0, with an innovative approach focused on skills and adapted to the needs and contexts of each education system.



C Hybrid education models as part of the solution to the learning crisis and the transformation of education

The closure of schools has left important lessons for education systems around the world, highlighting both the strengths and weaknesses of learning and teaching processes. [Experts](#) and [international leaders](#) have underlined the importance of face-to-face education for learning processes, socialization, interaction with peers and the development of skills (both cognitive and socio-emotional) in the school setting. A recent review of the available evidence on the effectiveness of distance, hybrid and face-to-face education suggests that, in the latter two, student learning is higher than in distance education (Elacqua et al., 2020).

Emergency remote education has also highlighted the central role of the teacher as the most important input of the learning process. Pre-pandemic evidence already indicated that teacher quality has a significant impact on learning outcomes in mathematics, language and executive function (Araujo et al., 2016). In this sense, the use of technology in education should focus on the students' learning needs and be viewed as a tool to support, complement and enhance the work of the teacher.

In addition, emergency remote education has drawn attention to the importance of involving parents and/or other family members in students' learning processes. A survey carried out in Bogotá (Colombia) in 2020 by the Universidad de los Andes, with the support of the PROBOGOTA Foundation, showed an increase in the participation of families in their children's education: 62% of carers indicated that their participation had increased in the absence of face-to-face classes. This was accompanied by an increased appreciation of teachers' work, with 70% of carers valuing their work more highly than in the previous period (García and Maldonado, 2021). Given that parents' involvement is positively associated with academic performance (Castro et al., 2015), it is crucial to promote alliances between families and schools.

However, emergency remote education has also revealed the shortcomings and gaps of existing systems, as regards the use of technological tools to achieve effective improvements in learning: pedagogical practices based exclusively on repetition and memorization, curricula based solely



on content and not on skills or competencies, classes designed for passive listening and lack of flexibility in supporting students' educational pathways.⁵

Education systems in LAC continue to face great challenges in ensuring learning continuity in the context of the health crisis. Most countries still have their schools closed or only partially open and are implementing remote or hybrid emergency models. However, to capitalize on the lessons learned from the educational crisis generated by the pandemic, it is necessary to take advantage of the accelerated adoption of technology in education and ensure that the actions being taken today lay the foundations for the transformation of education.

The objective of this transformation must be educational improvement, harnessing technology as a complement to the face-to-face model and incorporating the lessons and innovations derived from the pandemic. The experience of emergency remote education, acquired since March 2020 throughout the region has generated new capabilities, in both teachers and students, that must be incorporated into school practices (Jara, Ochoa and Rosende, 2020). These capabilities could be used to migrate to hybrid models that seek to support and enrich face-to-face learning processes through remote and virtual educational spaces.

Hybrid models integrate face-to-face and virtual educational spaces in a bid to expand learning opportunities. This does not imply using virtual teaching as an add-on to face-to-face teaching or replacing the latter with the former, but rather finding the most effective combinations of these two educational spaces as a means of fostering better, inclusive teaching for all students (Opertti, 2021). In this sense, the approach to hybrid models must build on strengths and opportunities. Hybrid models should not replace teaching work or face-to-face learning, but take advantage of the new opportunities that arise, in order to respond better to students' needs, improve the quality and equity of learning and promote a digital transformation of education through which to equip the region's children and young people with the tools for the needs and demands of today's world.

5. See Näslund-Hadley, Loera Varela and Hepworth (2014); Vygotsky (1978); Lowery (1998); Hmelo-Silver (2004); and Furtak et al. (2012) for evidence about the impact on learning of traditional classes versus active classes and pedagogical practices based on problem-solving, research and critical thinking.



Hybrid education models for addressing the learning crisis

The prolonged closure of schools will have a negative impact on learning outcomes, age appropriate schooling, dropout and progress through the different grades. Students from low-income households, as well as indigenous and migrant students and those with special needs, will be particularly affected, leading to a widening of the inequalities and gaps that already exist in the region (Álvarez Marinelli et al., 2020).

Before the pandemic, the education systems in LAC already faced major challenges in terms of gaps in access, low learning and structural inequalities. Prior to the closure of schools, 7.7 million children and young people between six and 17 years of age were not attending school (Acevedo et al., 2020). The age group most affected was 15-17 year-olds: one in five (18%) was not attending school and dropout was highest among the vulnerable students (24%) (Acevedo et al., 2020).

The PISA 2018 results showed that many LAC students had not acquired basic learning skills: 51% of young people had not achieved basic reading skills while, for science and mathematics, the figures reached 54% and 65%, respectively. There were, moreover, significant differences in learning by income quintile (Álvarez Marinelli et al., 2020). Students in the lowest income quintile (quintile 1) were, on average, two school years behind their peers in the highest quintile (quintile 5) (CIMA, 2018). By comparison with the average for OECD countries, the LAC countries participating in PISA 2018 were at least one year behind on reading: in Chile and Uruguay, the lag was equivalent to one year of schooling while, in Argentina, Brazil, Colombia, Costa Rica, Mexico and Peru, it reached two years and, in the Dominican Republic, four years (Bos, Viteri and Zoido, 2019).

Moreover, the devastating effects that the prolonged school closures are expected to have will further aggravate the situation in the region, both in terms of dropout and learning losses. Internationally, simulations carried out in July 2020 suggested that prolonged school closure (five months) could reduce average global schooling by up to 0.9 quality-adjusted years from 7.9 to 7 years. This would, in turn, imply an average loss of up to US\$1,408 in future average annual income (Acevedo et al., 2020)⁶ ([Acevedo et al., 2020](#)).

6. Simulations in terms of future lost earnings quantify the impact of learning loss on future income using existing evidence about the return on schooling, life expectancy, the utility of human capital in paid employment and earnings in the labor market. The average student in the cohort currently at school will face a reduction of up to US\$1,408 (in 2017 purchasing power parity [PPP] dollars) in annual earnings, equivalent to an average 8% reduction in expected earnings each year ([Acevedo et al., 2020](#)).



For LAC, according to preliminary simulations carried out in mid-2020, the COVID-19 crisis could result in at least a 15% increase in dropout, implying an additional 1.2 million children and young people between the ages of six and 17 outside the education system (Acevedo et al., 2020). This will lead to an increase in inequalities since many of these children and young people are from the most vulnerable families: 38% are from poor households and 44% from vulnerable middle-class households (Acevedo et al., 2020). Vulnerable households have been particularly affected by the conditions that make even more difficult achieving learning continuity during the pandemic, such as lack of access to connectivity and technological devices, overcrowding at home and adults without the necessary skills to support their children's educational process (Acevedo et al., 2020). New estimates suggest that, as a result of the pandemic, over 3 million students in LAC, from preschool to university level, are at risk of dropping out (UNESCO, 2020b).

The research carried out to date anticipates that school closures will have important effects in terms of learning losses. In a systematic review of international evidence between March 2020 and March 2021, Patrinos and Donnelly (2021) found that, in seven of the eight studies, there was evidence of learning losses in at least some of the students. This review also showed an increase in inequity, with learning losses largest among the most disadvantaged students and in early and primary education (Patrinos and Donnelly, 2021).

Some LAC countries have begun to work on estimates of the pandemic's impact in terms of learning losses. In the case of São Paulo (Brazil), it is estimated that, in 2021, the reduction compared to average scores in the SAEB 2019 tests will reach 20% in students in the 5th year of elementary education, 5% in the 9th year elementary education and 7% in the 3rd year secondary education (Education Secretariat of the State of São Paulo, 2021). The estimated impact among students in the 5th year of elementary education implies returning to values close to those of 2011 or, in other words, the loss of a decade of evolution of learning. In the case of Mexico, preliminary estimates, carried out using an instrument to measure the learning of students at home, indicate a lag in reading and math among students between 10 and 15 year-olds.⁷ On reading, 14.8% of 10-15 year-olds cannot read a story, 41.8% do not understand a 2nd-year primary school text and 61.6% do not understand a 4th-year primary school text. In the case of mathematics, the results show that 58.5% of 10-15 year-olds cannot do subtraction with borrowing, 36.4% cannot do simple subtraction, 88.2% cannot solve a 3rd-year primary school problem and only 3.5% could adequately complete an operation with fractions (Mexicanos Primero, 2021). In the case of Chile, the closure of preschool centers has been shown to have caused losses in general cognitive development, language and socio-emotional skills (Abufhele, 2021). The children assessed performed significantly below an

7. This instrument measures basic learning, rather than expected learning by school grade.



equivalent population in 2017 and the lags were not only statistically significant, but also of an important magnitude⁸ (Abufhele, 2021).

These simulations and estimates of the pandemic's effects in terms of dropout and learning losses reflect the great challenges that the region's education systems will face along their road to recovery. In addressing the learning crisis, effective hybrid education models offer a great opportunity to foster better-quality, more inclusive and more flexible education. Hybrid models increase the ability of students to learn at their own pace and achieve self-directed learning, key skills that must be developed to stimulate learning. In this context, the personalization of learning is one of the most effective means of accelerating academic and cognitive development (Arias Ortiz et al., 2020). Las simulaciones y estimaciones presentadas sobre el impacto de la pandemia en términos de exclusión educativa y pérdidas de aprendizaje ponen de manifiesto los grandes desafíos que los sistemas educativos de la región tendrán que enfrentar de cara a la recuperación. Con el fin de atender la crisis de aprendizajes, la implementación de modelos de educación híbrida efectivos ofrece una gran oportunidad para promover una educación de mayor calidad, inclusiva y con flexibilidad. Los modelos híbridos permiten aumentar la capacidad de los estudiantes de aprender a su propio ritmo y de lograr el aprendizaje autodirigido, habilidades clave que se deben desarrollar para estimular los aprendizajes. En este sentido, la personalización del aprendizaje que ofrece la educación híbrida es uno de los medios más efectivos para acelerar el desarrollo académico y cognitivo (Arias Ortiz et al., 2020).

Hybrid models are particularly useful to address the problems of poor academic performance and chronic absenteeism, particularly at the secondary level, as long as access to basic conditions is guaranteed. Because of their flexibility in terms of learning paths and times, they can serve as a remediation strategy that better fits the needs of students with a low performance and/or at risk of dropout.⁹

8. Three tests were used to measure the three dimensions analyzed: the Battelle Developmental Inventory-2 (BDI-ST2) for general cognitive development, the Child Behavior Checklist 1 (CBCL) for socio-emotional skills and the Peabody Picture Vocabulary Test for language development.

9. Section D, Module 7 discusses initiatives under flexible modalities for the reincorporation of students who have dropped out as well as for students at risk of dropout.



Hybrid education models to accelerate the transformation of education and promote Education 4.0

Beyond the pandemic, the growing adoption of technology will be a catalyst for the digital transformation of education systems. The implementation of hybrid education models must, therefore, be part of a broader strategy of transformation to make it effective, equitable and sustainable for both students and teachers as well as families (Arias Ortiz et al., 2020).

Current education systems are not only delivering weak, uneven and poor-quality learning outcomes; they are also preparing students for the jobs of the last century (IDB, 2020). Disconnection between education systems and the labor market is mainly the result of a combination of two phenomena: a labor market that is moving and adapting to technological changes at an unprecedented speed and education systems that have not been able to adapt to these new needs (Mateo-Berganza, 2021b).

The exponential growth of digital technologies, robotics, artificial intelligence (AI), the Internet of Things (IoT) and other new technologies has opened the way to automation, which has generated, and continues to generate, substantial changes in the labor market and jobs (Amaral et al., 2018). While it is true that some jobs and tasks are disappearing, new occupations are also emerging and employment is, therefore, growing (OECD, 2019). Technology drives employment through various channels. Indeed, digitally intensive industries accounted for 40% of the jobs created between 2005 and 2016 (OECD, 2019).

Jobs that involve mainly repetitive tasks are increasingly being automated, reducing demand for labor in these occupations. However, jobs that consist mostly of non-repetitive tasks and are, therefore, not easy to automate are on growing (Amaral et al., 2018). Amaral et al. (2018) presented evidence on the changes in demand for skills associated with changes in demand for labor, noting that, in all the countries analyzed, jobs related to technology and advanced digital skills are increasing and that there was particularly marked growth in demand for people-centered roles, which are less susceptible to automation. The authors highlighted the increase in jobs that require high levels of social intelligence for measuring and stimulating the reactions of individuals and making high-level decisions based on complex information.

In this sense, the transformation of labor markets does not necessarily entail a loss of jobs, providing that workers have the skills demanded by the labor market, and that is the key challenge: to narrow the skills gap. In LAC, there is currently a gap between what the labor market needs and what it finds, and this mismatch between supply and demand reflects a need to improve the alignment of education and training systems with the new labor market (Mateo-Berganza et al., 2019). Education systems must adapt to the needs of the Fourth Industrial Revolution (4IR), strengthening develop-



ment of the digital and socio-emotional skills that are key for the jobs of the present and the future (WEF, 2020). In this sense, Education 4.0 is conceived as a response to the needs of 4IR where the human being and technology must be aligned to make way for new possibilities (Hussin, 2018).

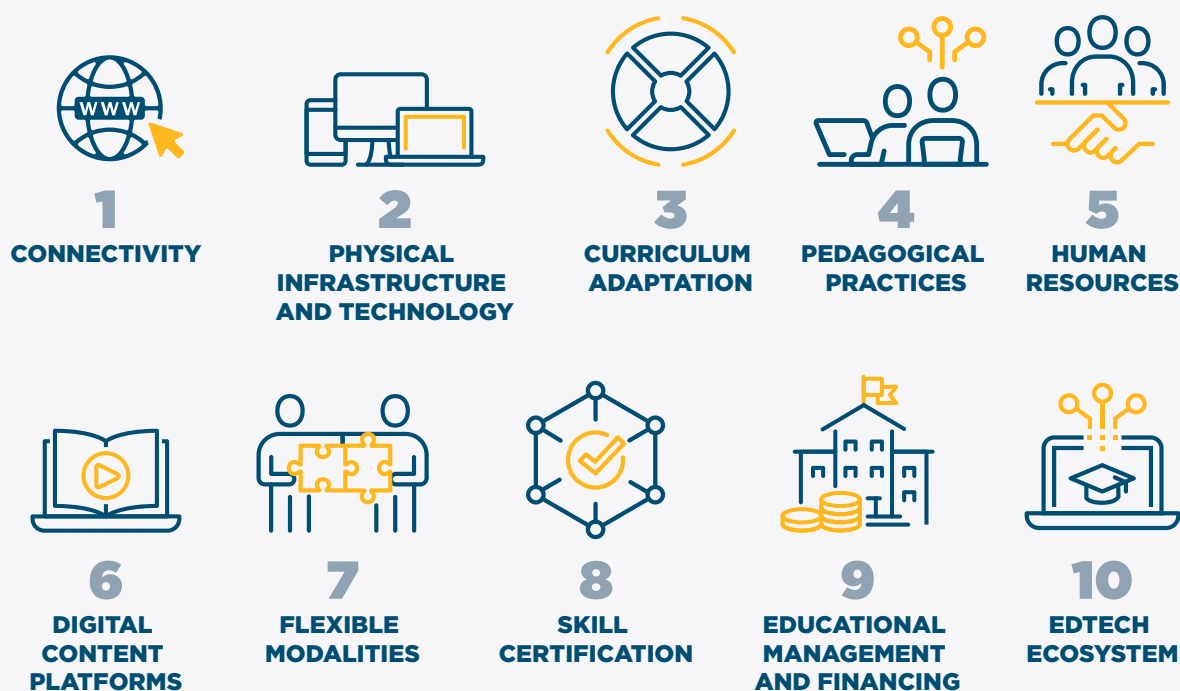
Many of the children and young people currently in the education system will work in jobs that do not yet even exist. Some estimates suggest that 65% of the children entering primary school today will end up working in completely new and currently non-existent occupations (WEF, 2020). Over the course of their lives, people will have to switch career and occupation more frequently than before. As a result, market demand increasingly calls for a greater focus on the development of skills, rather than training for specialized tasks, making the transferability of skills of key importance (Mateo-Berganza, 2021b).

The crisis caused by COVID-19 has given new urgency to the task of building education systems that are adapted to the needs of the twenty-first century and are able to provide better education, skills and employment. It offers an unprecedented opportunity to explore the actions required to prepare the labor force with new skills, implement new teaching and training mechanisms and create new learning ecosystems (WEF, 2020). The digital transformation of education is an opportunity to build better-quality, more inclusive and more flexible education systems that provide answers for the needs of the present and the future.

D Towards a modular implementation framework for hybrid education

The modular implementation framework for the development of hybrid education models is structured around ten components or modules (Figure 5). The rationale behind the modular framework is that each country or education system will be able to select and combine those modules that best suit its context, enabling it to develop its own roadmap for hybrid education. In other words, the framework offers adaptability and flexibility while establishing the minimum modules required to implement effective hybrid education in its different modalities.

FIGURE 5 ► MODULES FOR THE IMPLEMENTATION OF HYBRID EDUCATION





Why advocate a modular implementation framework for LAC? It is a heterogeneous region where different contexts and realities coexist in aspects such as digital conditions, governance of education systems, institutional capabilities, characteristics and needs of the student population and available resources. Similarly, because response to the pandemic has also been heterogeneous, students have had very diverse educational experiences. In other words, as the region seeks to recover, there is extreme disparity, calling for strategies and interventions that are both highly effective and flexible in responding to this heterogeneity (Mateo-Berganza, 2021a). In this context of great heterogeneity it is particularly important to conceptualize modular implementation models that can be adapted in terms of learning objectives and with reference to the system's level of readiness/development.

Thus, the basis for the implementation of the modular framework is to assess readiness for hybrid education in each context in order to establish a diagnosis of each education system's starting point, identifying its strengths and the areas of investment that should be a priority. To achieve a real transformation and sustain the process beyond isolated efforts, hybrid education models must respond to specific needs and challenges, calling for the adoption of the most relevant modules for the particular context and their staggered implementation in phases.

A series of instruments have been developed to assess the starting conditions for the integration of technology into learning or the management of education. In the first case, it is worth highlighting the [GuiaEduTec](#), created by the Center of Innovation for Brazilian Education (CIEB). This free online tool for the assessment of schools' level of adoption of educational technology was inspired by similarly successful initiatives in other countries. It also provides guidelines for improving practices in using technology for students' learning, enhancing teachers' digital skills and optimizing school management, considering the school starting point.¹⁰ The vision that underpins GuiaEduTec assumes that, in order to achieve the maximum potential of the use of technology in education, the different elements must be in balance. In other words, it makes little sense to make large investments in infrastructure if teachers are not trained. Similarly, it is worthless to draw up ambitious strategies for the use of technology in the absence of adequate connectivity and digital educational resources. The IDB is working to adapt GuiaEduTec for Spanish-speaking countries.

In the case of Education Management and Information Systems (SIGEDs), the IDB has designed an instrument that allows assessing how daily education management processes are carried out, their level of automation and the extent to which they make use of digital technologies, in order to design a roadmap for management efficiency in education (Arias Ortiz et al., 2019). To date, the project has completed 16 case studies of public education systems in the region that are responsible for

10. See <https://guiaedutec.com.br/escola>.



the provision and management of educational services.¹¹ Through SIGEDs, accompanied by public policies that define the allocation of resources (financing, teachers, students, transparency, etc.), progress can be achieved towards the digital transformation of management and the optimization of efficiency and equity in the allocation of resources.

This vision of balance and complementarity is what inspires the modular implementation framework. Its aim is for each country to be able to build adapted models, drawing on existing achievements and enabling the development of the most incipient components, in order to achieve true optimization of the advantages and opportunities offered by hybrid education models.

Ten modules for the implementation of hybrid education models

The ten modules that are part of the modular framework for the implementation of hybrid education are described below. A brief conceptualization of each module is presented, along with a selection of experiences and resources. It is important to note that the selection of experiences is not exhaustive and there is not necessarily evidence as to their effectiveness in practice. Instead, they were chosen because they stand out as promising and innovative initiatives.

11. See <https://publications.iadb.org/es/los-sistemas-de-informacion-y-gestion-educativa-siged-de-america-latina-y-el-caribe-la-ruta-hacia>



1

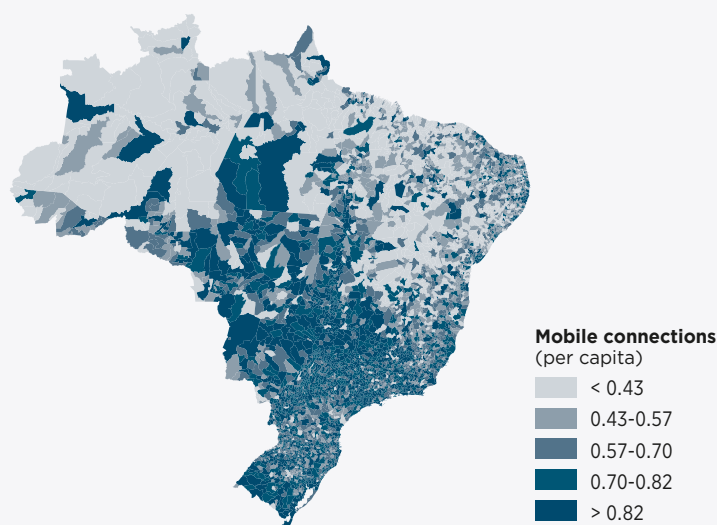


CONNECTIVITY

Access to good quality Internet is a basic resource for the implementation of effective hybrid education models. However, as indicated in Section B, LAC countries have great challenges in this field. Undoubtedly, gaps in access to Internet and its use were one of their greatest challenges in seeking to ensure learning continuity in the context of school closures.

In the case of Brazil, connectivity data from the National Telecommunications Agency (ANATEL) illustrates the scale of this country's digital gap. In Map 2, showing mobile connections per capita, it can be seen that the municipalities with the least connectivity are mostly in the north and northeast of the country, while those with the greatest connectivity are in the south and southeast, indicating a positive correlation with a municipality's Human Development Index (HDI) that only makes the differences in access more worrying (Arias Ortiz et al., 2021).

MAP 2 ► NUMBER OF MOBILE CONNECTIONS PER CAPITA BY MUNICIPALITY, BRAZIL





To reduce connectivity gaps among students in the context of school closures, LAC governments have implemented different arrangements in a bid to ensure Internet access for students and teachers. They have proven to be a good strategy for beginning to resolve the lack of access associated principally with price. According to the Economic Commission for Latin America and the Caribbean (ECLAC), broadband and mobile services cost 14% and 12%, respectively, of the income of the first quintile of the population (ECLAC, 2020). This is six times the benchmark threshold of 2% of income recommended by the Broadband Commission for Sustainable Development for classifying an Internet service as affordable.

Information gathered by the IDB in February 2021 shows that LAC countries have implemented different types of connectivity arrangements in the face of school closures (Table 2). One of the most commonly used strategies is free access to educational platforms and websites. Arrangements of this type guarantee basic access to certain materials and content but do not resolve access to other resources and tools, such as videoconferences between students and teachers, access to audiovisual content (YouTube or Vimeo) or other content platforms that tend to be used for teaching.

TABLE 2 ▶ SOLUTIONS FOR EXPANDING ACCESS TO CONNECTIVITY IMPLEMENTED DURING THE PANDEMIC IN LATIN AMERICA AND THE CARIBBEAN

	Argentina	Bahamas	Barbados	Belice	Bolivia	Brasil	Chile	Colombia	Costa Rica	Ecuador	El Salvador	Guatemala	Guyana	Haití	Honduras	Jamaica	México	Nicaragua	Panamá	Paraguay	Perú	Rep. Dominicana	Surinam	Trinidad y Tobago	Uruguay	Venezuela
Free Internet access to educational platforms and sites (.edu)																										
Free Internet access for low-income households																										
Free Wi-Fi hotspots																										
Direct subsidies for Internet																										

Source: Compiled by authors based on data gathered by the IDB's Education Division.

Note: Last updated on February 26, 2021.

Another type of arrangement has been to subsidize the cost of connectivity for students from low-income households through either zero-rated access or free monthly data packages. In the case of the latter, it is important to ensure the sufficiency of the data plans. Given the high GB consumption of certain resources, such as videoconferences, limited free plans do not guarantee access to or use of all the potential resources. Free Wi-Fi hotspot solutions have also been implemented but are less common, which makes sense in the context of the health crisis since they permit access only at certain focal points and not from home.

BOX 1 ► EXPERIENCES OF CONNECTIVITY ARRANGEMENTS DURING THE HEALTH CRISIS IN SELECTED LAC COUNTRIES



ARGENTINA

Through the National Communications Entity (ENACOM), the Education Ministry of the Nation reached agreements with the country's three mobile telephony companies for free access to educational platforms. Preschool, primary, secondary and special education students can access the *Seguimos Educando* (We Continue Educating) portal without consuming data.



CHILE

Thanks to an alliance between the Education Ministry (MINEDUC), the Transport and Telecommunications Ministry (MTT) and the Mobile Telephony Association (ATELMO), access to the *Aprendo en Línea* (I Learn Online) website from mobile devices (tablets and smartphones) was liberated so that it could be used without consuming data.



COLOMBIA

In collaboration with the Information and Communications Technologies Ministry, the National Education Ministry established access to the digital educational content of the *Colombia Aprende* (Colombia Learns) platform without data consumption. This benefit, which applies to users with consumption services of around US\$18.00, targets principally the poorest households.



COSTA RICA

An agreement was reached with the Costa Rican Institute of Electricity (ICE), the state electricity and telecommunications company, to permit access to the educational platform without data consumption.



JAMAICA

The Education Ministry (MOEYI) reached an agreement with Digicel to provide access to learning platforms and commonly used websites with subsidized and zero-rated data. MOEYI also reached agreements with the two main Internet providers (Digicel and FLOW) on credits and discounts for data plans for teachers (US\$3.70 for 14 days). For beneficiaries of the PATH conditional cash transfer program, MOEYI and the Labor and Social Security Ministry will cover the cost of Internet.



URUGUAY

The Universal Household Plan of the National Telecommunications Administration (ANTEL), created in 2009, provides vulnerable households with 1 GB free-of-charge per month, with an installation cost of US\$10.00. As a temporary measure in response to COVID-19, the connection tariff was lifted from April to end-July 2020. In April 2021, in response to a renewed suspension of face-to-face classes, ANTEL provided a free monthly pack of 50 GB. In addition, the Conferences tool of the CREA platform has been optimized so that videoconferences can be held, and people can participate without consuming data.^a This was possible because the Ceibal Plan has installed videoconference servers in Uruguay and the related traffic is local.

a See the article [Navegar en CREA y usar Conferencias no consume datos](#) (in Spanish only).



Cooperation between education ministries, the state agencies responsible for regulating telecommunications and a country's telecommunications companies is essential for the implementation of strategies to expand access to connectivity for all students and their use of it. Similarly, alliances with the main service and resource providers are crucial. For example, initiatives in coordination with companies providing videoconferencing services can play an important role in fostering the installation of videoconference servers in each country, thanks to which these services can be included in zero-rated access for students and teachers and the cost of the traffic be borne by the education ministry.

Along with connectivity arrangements, countries must also have in place alternatives for the distribution of digital content without Internet access. Despite their limitations, these arrangements serve as a short-term solution for guaranteeing access in rural or remote areas without connection.¹²

12. Some examples of solutions for the distribution of digital content without access to Internet can be found in Module 6 on platforms and content.



2



PHYSICAL INFRASTRUCTURE AND TECHNOLOGY

Like access to connectivity, access to digital infrastructure is also a basic resource for the implementation of hybrid education models. Faced with the closure of schools and the enormous challenges that exist in LAC in terms of access to devices, the region's governments have taken concrete measures. According to information gathered by the IDB in February 2021, 16 of the 26 countries surveyed had acquired or planned to acquire tablets or computers for students.

It is important to select devices suited to students' age and stage of education. For younger children, tablets are usually recommended since they are better for exploration and discovery by touch. As from the age of eight or ten, however, computers offer greater benefits in terms of encouraging creativity and exploration whilst also facilitating the development of other skills such as programming and robotics.

One of the main challenges of providing students with technological devices lies in procurement processes. They can be structured in three key phases: 1) planning; 2) definition of the specifications; and 3) evaluation and award. The IDB's Education Division has prepared a guide that seeks to make available, in a simple and easy-to-use manner, all the information necessary to promote best practices in the procurement of digital products and services for education.

Apart from the administrative processes, a fundamental part of ensuring efficient resource allocation lies in good procurement planning. The first step is to define the needs and the education problem to solve in order to evaluate the different possible solutions before asking how technology can be used. It is, in addition, necessary to have a clear picture of the education system's strengths and weaknesses in order to ensure their suitability and adaptability to each specific case.

The recent experience of Belize, which is in the process of acquiring tablets for 14,000 vulnerable students, is an example of good practices in tailoring procurement to students' needs and demands. Given the large number of Spanish-speaking immigrant students among the intended beneficiaries, the specifications for the procurement process required that the tablets come with the Duolingo application, a tool that is useful in helping Spanish-speaking migrant students learn English.



3



CURRICULUM ADAPTATION

Curriculum adaptation is a key step for ensuring a real transformation of education systems that prepares children and young people for the future. Over the past decade, some countries in the region have embarked on curriculum transformation processes, incorporating the skills of the twenty-first century, with digital skills at the forefront of these transformations.

The implementation of effective hybrid education models must be accompanied by a process of curriculum adaptation with a focus on competencies and skills, abandoning pedagogical practices based on the repetition and memorization of a wide range of content.¹³ This transformation implies an in-depth review of the curriculum and standards, leading to new ways of learning and teaching to guide the educational process. The development of information and communications technologies (ICTs) has changed how today's citizens relate to content and information: in this new paradigm, it is key to “learn to learn” in order not only to acquire new content and knowledge, but also be able to transfer the competencies and skills acquired to other areas.

LAC has one of the world's largest skill gaps. The region's training systems, including schools, are geared to obtaining qualifications based on curricula that have not been updated in line with current needs and demands. Moreover, the rigidity of education systems has hampered the incorporation of the skills of the twenty-first century into traditional curricula, leading to an even greater disconnection between the world of education and the world of work (Mateo-Berganza et al., 2019). Digital skills, such as digital literacy, computational thinking and digital citizenship, as well as transversal and socio-emotional skills, such as creativity, critical thinking and communication, are essential for the work of the present and the future (Mateo-Berganza et al., 2019).

A wide range of innovative initiatives are currently being implemented in a bid to promote curriculum adaptation and better fit learning experiences to today's children and young people. In Paraguay, an alliance between SK Telecom and the IDB has introduced coding education, using manuals and

13. For example, deep learning emphasizes the importance of limiting the content to which a student is exposed in order to focus more deeply on each particular piece of content. Only deep learning endures over time and permits the development of competencies and skills that the student will be able to transfer to other spheres. .



“Albert” robots to develop skills such as creativity, computational thinking and problem-solving.¹⁴ The pilot project, known as [Irûmi](#), is being applied in 104 schools in Paraguay, giving priority to the components of curriculum development, training, implementation and assessment. In the case of curriculum development, a key aspect of the adaptation of the curriculum and the textbooks used in the Irûmi project is its work together with teachers to ensure that activities to develop computational thinking reflect the interactions that occur in the classroom and students can learn programming naturally.

The [Code Caribbean](#) program, a joint initiative of the IDB and the Code.org organization, seeks to expand and develop digital, transversal and entrepreneurial skills among the most vulnerable young people in the Caribbean, thereby increasing their employability in the digital economy (Rieble-Aubourg, 2020). The project consists of training a group of coaches from higher education to teach digital skills to secondary students, emphasizing the development of critical skills, such as computational thinking, problem-solving, and AI, that, combined with entrepreneurial and social skills, will help the young people to be more successful in the labor market (Rieble-Aubourg, 2020). The project includes a regional diagnostic evaluation in the Caribbean to gain a better understanding of each education system’s level of development in this field and the interest of public institutions in implementing a curriculum focused on digital skills.

In Uruguay, the Ceibal Plan’s [Computational Thinking](#) program, developed with the Sadowsky Foundation, aims to prototype solutions through the use of programming and educational robotics, employing a methodology based on problem-solving. With a design based on pedagogical partners, comprising a remote teacher and a classroom teacher, it goes beyond digital competencies and seeks to develop skills such as the capacity for abstraction and the ability to identify patterns, order operationally and identify the components of a problem. The program uses [micro: bit](#) boards. These small programmable boards, designed for students with little or no programming knowledge, make learning fun and easy. They are available to all students who request them.

Another innovative initiative is the [Historias para Armar](#), project, developed by Disney and Chicos.net with the collaboration of Eidos Global. It combines storytelling, digital media and the maker culture as a strategy to offer innovative and attractive experiences for 8-11 year-olds, fostering the development of twenty-first-century, socio-emotional and reading and writing skills, enhancing the opportunities offered by technology. Through a digital-interactive platform, the initiative offers resources and content, adapted to the new ways of learning at school and at home, through hybrid and integrated pedagogical models. With a strong commitment to inclusion, the initiative is free, allows the download of all its content for offline access and includes tools and content adapted to different contexts, with a low-tech logic that implies minimal technological requirements. In addition, the platform provides tools and resources for teachers and families.

14. See <https://www.k12digest.com/crackthecode-how-sk-telecom-is-generating-social-value-through-coding-education-in-paraguay/>.



4



PEDAGOGICAL PRACTICES

Pedagogical practices are key if hybrid education models are to foster improvements in both the quality of learning and equity. The use of technology in education and the complementarity between remote and face-to-face learning spaces open new doors for personalizing education and making learning more attractive. Teachers must be trained not only to adopt technology, but also to use it to foster students' acquisition of transversal skills - such as critical thinking, teamwork and flexibility - incorporating new sources of learning and creating personalized student-centered experiences that are relevant and engaging (Arias Ortiz et al., 2020). Curriculum adaptation processes that promote a focus on skills and competencies must be accompanied by intense work together with teachers, so they develop their own skills and use pedagogical practices to pass these skills on to their students (Arias Ortiz, Hincapié and Paredes, 2020).

However, the effective implementation of hybrid models also necessarily implies understanding the differences between face-to-face and remote learning settings. Strategic planning is required to define the tools, techniques, activities and approaches appropriate for each of these settings, based on the understanding that remote learning spaces and the incorporation of technology serve to complement students' educational experiences. Face-to-face spaces must seek to promote interaction between students and teachers, foster teamwork, deepen and reinforce new content and topics introduced during time at home, and clarify the doubts that students may have. Remote time, on the other hand, can be more efficiently used to explore and introduce new topics and content, with greater personalization and adaptation to each student's learning pace, and is ideal for work on activities carried out and competencies acquired in the face-to-face setting. It should be noted that the problem-solving work methodology is conducive to mixing face-to-face and virtual learning experiences, optimizing student participation and interest.

Teachers must also incorporate a set of skills different from those required for traditional face-to-face education. For example, in face-to-face teaching, they communicate with students through body language, as well as using verbal and written communication, and can observe and interpret the reaction of students and detect and respond quickly to those who are having difficulty with a task or are lacking in motivation. This repertoire of teaching practices and skills does not translate readily to remote learning settings. Teacher training institutions in LAC tend not to include the development of competencies for hybrid or remote teaching in their programs and there is, as a result, an important gap in this area. Although teachers have shown an amazing ability to adapt to emergency remote education, it is necessary to train them, so they have the necessary tools and



skills to be effective in a setting in which remote and face-to-face learning spaces are interconnected and constitute a continuous learning experience.

The success of initiatives to develop students' skills depends, to a large extent, on the quality of the training and support teachers receive for their implementation. In this, teacher training programs with mentoring and feedback have an essential role (Arias Ortiz, Hincapié and Paredes, 2020). The IDB, in collaboration with the Regional Bureau for Education in Latin America and the Caribbean (OREALC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO), is developing a framework to systematize and evaluate teacher professional development models for remote and hybrid learning, with the aim of promoting pedagogically-driven hybrid education through standards and better practices for teachers training (Berlanga et al., 2020). In addition, the project seeks to identify and systematize best practices for effective professional development that helps teachers acquire and improve the pedagogies and skills necessary for remote and hybrid teaching.

The [TEC.LA](#) initiative, implemented by Eidos, is designed to train teachers to teach computational thinking and the skills of the twenty-first century. It aims to provide a space for learning new educational practices by stimulating these skills, which are necessary for the full development of the digital economy.

The [Modern Classroom Project](#) initiative, launched in the city of Washington in 2017, enables teachers to build classroom experiences that respond to the needs of each student. The model is based on three principles: hybrid education, student self-pacing and a mastery-based approach. It seeks to take advantage of technology to foster human connection, authentic learning and socio-emotional growth. One of the main innovative practices this project promotes is the replacement of traditional lecture-type classes with instructional videos created by the teacher, which allow students to learn at their own pace and the teacher to devote more time to close individualized work in class.

Self-assessment instruments that enable teachers to evaluate their own pedagogical practices and adoption of technology are a valuable input for the design of training processes and help to promote good practices and identify opportunities for improvement. The teacher component of [Guia EduTec](#) of the Center of Innovation for Brazilian Education (CIEB) permits self-assessment of digital skills and offers roadmaps, resources and tools for taking advantage of digital skills in the classroom. In this way, it seeks to encourage teachers to lead their own professional development, opening the way to changes in their pedagogical practices.¹⁵

15. See <https://guiaedutec.com.br/educador>.



It is also important to mention the European Commission's free tool [SELFIE](#). Available in all the EU languages, it is a self-assessment resource for the three components of schools - directors, teachers and students - that shows how technology is being integrated into the school ecosystem. One of the main advantages of SELFIE is that it can be used to draw up improvement plans and is conducive to monitoring progress. Based on the information collected anonymously by the instrument, it generates a report - a "selfie" - on each school's strengths and weaknesses in the use of technology and offers improvement strategies for both the teachers and authorities.

Hybrid education models must also incorporate pedagogical practices that are effective in improving the learning of the most vulnerable students and reducing gaps. The pedagogical approach known as [Teaching at the Right Level](#) (TaRL) does this by grouping children according to their learning needs (rather than their age or school year), devoting much of the time to developing skills (rather than focusing solely on the curriculum) and tracking students' progress (rather than relying only on end-of-year exams). Evaluations by J-PAL-affiliated researchers over the past 15 years have shown that the TaRL approach improves learning outcomes. In a scenario that poses great challenges in terms of learning losses and gaps, the implementation of pedagogical approaches of this type, which take into account students' learning needs, can be a very useful strategy.

5



HUMAN RESOURCES

Although teachers are the fundamental link in the chain for effective implementation of hybrid education models, all human resources of the education systems must be aligned, prepared and trained for migration to hybrid models. Training on new pedagogies, skills for the twenty-first century and digital competencies for management and ministerial teams is essential if the education system as a whole is to accompany and guide teachers in the transformation of teaching and learning processes.

It is important to stress the crucial role of training school directors for leadership of the transformation of educational models. In the case of digital skills and the use of technology, the evidence shows that their support is essential for teachers' adoption of these tools. When teachers feel they have the backing of their director, they make greater use of technology in the classroom (Severín and Capota, 2012).

Another central aspect as regards human resources is the promotion of policies for the efficient and equitable allocation of teachers. They are the most influential input for improving the quality of education and have an important effect in reducing learning gaps, particularly in schools that serve lower-performing students (Bertoni et al., 2020). Moreover, they represent the largest item of educational spending, accounting for between 60% and 90% of education budgets. There must, therefore, be processes to ensure their efficient distribution since improvements in the allocation process will have a direct bearing on the education system's quality and equity. The IDB has launched a [series of pilot project](#) for centralizing teacher allocation in Peru and Ecuador using AI. Centralizing the selection process for assigning teachers to schools increases the efficiency and equity of the education system and circumvents mechanisms that result in the best teachers being concentrated in better-off schools.

The implementation of hybrid education models also implies new demands for human resources at the central level. Educational innovation not only requires a system of governance to lead change, but must also be accompanied by normative frameworks that regulate the digital ecosystem and respond to new challenges in areas such as ethics and data privacy, cybersecurity arrangements and the ethical use of AI (Arias Ortiz et al., 2020). For this, education ministries and secretariats must be able to strengthen their capabilities, train their human resources and incorporate new experts to advise them on the transformation processes.



6



DIGITAL CONTENT PLATFORMS

Digital platforms are a key ally for hybrid education models since they facilitate the distribution of content, promote the development of skills, strengthen ties between students and teachers in distance education and facilitate the monitoring of learning (Arias Ortiz, et al. 2020).

The availability of platforms, software and content, which fulfill different roles in a hybrid education model, increased and strengthened significantly in 2020. A very good strategy, adopted by some countries of the region, is to use and adapt existing material and content, taking advantage of accumulated knowledge without wasting time or resources on the creation of new platforms.

The creation of centralized repositories at the level of the education ministry or secretariat has proved extremely useful in fostering the use of content platforms and increasing the effectiveness of their use. These repositories, which centralize the available material in terms of both content and platforms, do not imply the generation of new content, but the organization of content that has been curated and reviewed for its use. To facilitate their use in a simple and easy way, content repositories must permit segmentation by type of channel (Internet, applications, radio, television); audience (teachers, students, families); educational level (preschool, primary, secondary); and area of knowledge (mathematics, reading and writing, social-emotional skills, etc.).

In addition to facilitating access to content and its distribution, these repositories should promote feedback and permit the sharing of resources among the different actors and levels of the education system (crowdsourcing), seeking to optimize the existing content and the exchange of experiences among the actors. [*Aprenedo en Casa*](#) (I Learn at Home), is a collaborative initiative that brings together over 70 leading educational organizations, representing seven countries of the region. The initiative - led by the Harvard Office in Chile, the BHP Foundation and the REimagina Foundation - seeks to provide content and digital tools in an agile, timely and easy way and to support teachers, school directors and families in the transition to hybrid education (Raad, 2021). It is the first regional experience of crowdsourcing between countries for the distribution of educational content and has positioned itself as a benchmark for collaboration, facilitating the exchange of experiences, avoiding duplication and promoting cooperation model between civil, public, private and academic organizations in the region (Raad, 2021).



It is important to stress that learning platforms must be aligned with the curriculum and should ideally permit monitoring of learning and feedback between students and teachers. Learning management platforms (LMS) and communications platforms are key allies for the optimal use of learning platforms since they favor exchange between students and teachers and make for fluid relations with families.

Box 2 presents a selection of content and learning platforms, based on the experiences of different countries in the region.¹⁶

16. This is not an exhaustive selection of interactive platforms and applications. Other important learning platforms also exist and the selection was based on criteria of use applied in the region and level of maturity/development.

BOX 2 ▶ INTERACTIVE PLATFORMS AND APPLICATIONS FOR
MATHEMATICS AND READING AND WRITING

MATHEMATICS

[Matific](#)

A mathematics platform used at the primary level that permits the creation of personalized problem-solving paths

[Khan Academy Kids](#)

A free app for 2-6 year-olds with educational activities, books, songs and games. The content includes activities for socio-emotional development.

[Bettermarks](#)

Bettermarks is an adaptive mathematics platform that replaces textbooks and exercise books, enabling students to learn from their mistakes. It is available for the primary and secondary levels.

[Conectaldeas](#)

Conectaldeas uses play to motivate students to learn mathematics. By introducing elements of play and healthy competition in the teaching of this subject, assisted by technology, it increases student motivation, generates greater learning and helps reduce gaps.

READING AND WRITING

[Feed the Monster](#)

An educational game that helps children learn to read. It is designed to empower children in a fun and self-managed learning process through exploration and curiosity.

[GraphoGame](#)

GraphoGame is an entertaining and easy-to-use tool that helps children learn to read by practicing letters and their sounds, syllables and words. Children choose their avatar and, as they play, progress to higher levels of complexity. The game moves from letters to syllables and, finally, complete words.



When choosing the appropriate technology to support remote learning, a country's infrastructure and the contextual and social conditions must be considered, along with students' proximity to the technological resources to be used (Jara et al., 2020). On the road to hybrid education, it is, therefore, necessary not only to promote the use of digital platforms for learning, but also to implement multi-channel strategies that permit access to educational content in remote learning spaces for those students who do not have devices and/or a connection to Internet. Until education systems can guarantee access to devices and connectivity for all students, content for television and radio, as well as strategies for the offline distribution of digital content, will be essential to avoid widening access gaps. Box 3 presents some examples of educational resources for television and radio.

BOX 3 ► EDUCATIONAL RESOURCES FOR TELEVISION AND RADIO

CONTENT FOR TV



Sésamo

An educational television series adapted from Sesame Street for preschool children in Latin America. Originally known as Plaza Sésamo, Sésamo has developed into a multi-platform experience. With financial support from the IDB, Sesame Workshop will provide over 100 hours of the iconic series for Latin America as well as new animations, songs and more resources to help during the COVID-19 pandemic.

Center for Media Education in Amazonas

Media Center

A program created in 2007 to provide televised classes for remote areas of Brazil's State of Amazonas. The Center for Media Education in Amazonas broadcasts daily live classes for communities in rural areas, using real-time interactivity resources and planned media for the development of synchronous and asynchronous classes. It also has a satellite videoconference system with audio and video interaction. It is a very good initiative at the local level that could be optimized with its expansion to other Brazilian states.

CONTENT FOR RADIO



BBC Teach - School Radio

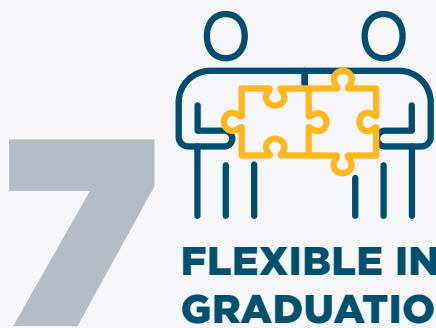
Radio content organized by area of knowledge and age group. It is structured as units by topic and sub-topic, each with an audio collection. (Available only in English.)



Solutions for the distribution of digital content in remote and rural areas without Internet access have proven to be a very good strategy for ensuring equitable access to this content. In solutions of this type, it is necessary to bear in mind the kind of digital content that is available and how students and their teachers communicate. Investment to expand access to Internet and its use is essential to reduce the existing connectivity gaps but offline content distribution strategies, despite their limitations, serve as a quick and effective solution.

At this point, it is worth mentioning some strategies that have been developed to facilitate offline access to digital content. For example, the Ceibal Plan in Uruguay has developed the option of downloading content for use when students are offline. When they can connect again, their progress is automatically uploaded to the network so the teacher can see it.¹⁷ To provide access to digital content for students in remote and rural areas, Honduras uses the Kolibri platform, which has been in operation since before the COVID-19 pandemic. The Honduran Education Ministry gave Hombro a Hombro, a local NGO, access to all government textbooks in digital format so they could be used on this platform. Kolibri is an open-source educational platform with the key advantage that it does not require an Internet connection to access its content. It was specially designed to address the challenges faced by people with limited or no connectivity and, therefore, facilitates content distribution and data retrieval.

17. See <https://www.ceibal.edu.uy/es/articulo/puedo-utilizar-matic-si-no-tengo-conexion> and <https://www.ceibal.edu.uy/es/articulo/como-puedo-acceder-los-materiales-de-un-curso-en-crea-desde-la-aplicacion-en-modo-sin-conexion>.



FLEXIBLE INCORPORATION AND GRADUATION MODALITIES

Dropout in LAC was already a concern before the pandemic. Rates of young people outside the education system were high, particularly at the secondary level. As indicated in Section C, the closure of schools due to COVID-19 is expected to have devastating effects in this field.

In this context, hybrid education models must include tools for the identification of students at risk of dropping out as well as strategies to keep them in the system until they complete their studies. This is not a simple task: dropout is a complex and multi-causal phenomenon. The accumulated evidence shows that no single factor explains the interruption of a student's educational pathway (Freeman and Simonsen, 2015). However, the incorporation of technology can help address at least some of the intervening factors.

Early warning systems serve to identify students at risk of dropout, permitting the activation of targeted and timely interventions and strategies, and are a fundamental tool for the protection of educational pathways and the reduction of dropout rates in the region. In addition, hybrid education models can be used to develop flexible and attractive educational models adapted to the needs of students who have interrupted their studies or are at risk of doing so. In this context, it is necessary to build on flexible modalities that offer the children and young people a real opportunity to continue their studies, taking advantage of technology and the complementarity of remote learning spaces. Initiatives of this type are crucial for the reintegration of students and the retention of those at risk of dropout, offering them new alternatives tailored to their needs, interests and motivations.

An interesting early experience is the *Vuelvo a Estudiar Virtual* (I Go Back to Virtual Studying) program, implemented since 2013 in Argentina's Santa Fe Province as a flexible option for the completion of secondary studies, adapted to over-18s for whom a return to daily face-to-face education is practically impossible (Education Ministry, Province of Santa Fe, 2019). The program uses a hybrid education model and its curriculum comprises didactic interdisciplinary pedagogical modules, based on socio-community action projects (Education Ministry, Province of Santa Fe, 2019). It combines distance education with compulsory monthly meetings and optional face-to-face consultation classes. The implementation of a hybrid model that can be adapted to students' needs is itself an innovation, but the program also innovates pedagogically through its adoption of a curriculum based on interdisciplinary modules, with a strong emphasis on team and project-based work, which permits social appropriation of the knowledge acquired through emancipatory, rele-



vant and meaningful learning. The combination of these different elements in the program's design, therefore, enables it to respond to the demands of a sector of the population that could otherwise drop out. In this way, it achieves effective inclusion in the education system (Gerlero, 2020).

Another experience in the region is the model of face-to-face education mediated by technology used in Brazil's State of Amazonas. Given the characteristics of its disperse rural areas without connectivity, the state transmits satellite classes from the Media Center in Manaus to students in classrooms around the state, where they are accompanied by a mediator teacher. Thanks to this initiative, many students have been able to complete their secondary education while others, who had dropped out because of a lack of suitable alternatives, have resumed their studies and graduated.



8



SKILL CERTIFICATION

Skill certification is fundamental for improving the labor market insertion of the region's young people since it permits identification of the specific skills they need to acquire. In addition, it plays a key role in the world of education by supporting the paradigm shift to an emphasis on competencies and learning, accompanied by flexible and personalized educational paths, and helping to connect students with the demands of the labor market.

Hybrid models call for stronger and more diverse tools for measuring learning. This involves creating mechanisms through which young people can demonstrate the skills they have acquired - which have not traditionally been measured - and which are today required for both access to higher education programs and incorporation into the labor market.

A case in point is the [CLIC](#) initiative, which evaluates and certifies transversal skills so users can effectively show a digital portfolio of skills.¹⁸ This platform contributes to four key elements of skill certification: identification, development, validation and communication, with the aim of increasing young people's educational and job opportunities by giving visibility to their skills and competencies.

In today's world, the portability of accreditations is also essential and blockchain technology is being used to guarantee both the portability and security of certifications. In this field, the Caribbean Examinations Council (CXC) has implemented a pilot project under which 24,000 students have received their certificates through blockchain technology. This allows them to receive their final exam certificates through the free, open-source Blockcerts Wallet, which can be used to store, share and verify candidates' exam results.¹⁹

18. See <https://clic-habilidades.iadb.org/es/certificacion#secMarket>.

19. See <https://www.cxc.org/cxc-pilots-e-certificates-on-the-blockchain/>.



EDUCATIONAL MANAGEMENT AND FINANCING

Another no less important aspect of the development of effective hybrid education models is their financial sustainability over time (Arias Ortiz et al., 2020). For LAC countries, guaranteeing the necessary investment for the transformation of an education system is a great challenge, particularly in a context of fiscal restrictions such as those faced in the region in the wake of the pandemic²⁰ (Cavallo and Powell, 2021). Here, two key strategies warrant attention: 1) improvement of the management of education and efficiency in spending, and 2) additional resources obtained through alliances with the private sector, civil society and international cooperation.


The digital transformation of Education Management and Information and Systems (SIGEDs) generates a series of benefits in terms of management and spending efficiency: i) it means that timely and high-quality information is available for policy design and the allocation of resources (human, physical and financial); ii) it improves the use of human resources due to the time saved by the digitization of administrative tasks; and iii) it implies budgetary savings, thanks to efficiency gains as a result of the availability of high-quality information and time savings (Arias Ortiz et al., 2021). SIGEDs, accompanied by public policies that define the allocation of resources (financing, teachers, students, transparency, etc.), permit progress towards a digital transformation of education management, favoring the optimization of efficiency and equity in resource allocation.

The strengthening of alliances between education ministries and the private sector is central to ensure the financial viability of transformation processes, given the investment required in infrastructure and structural conditions as well as the development of platforms, content and systems. The public-private alliances formed in some countries of the region, in the context of the implementation of emergency remote education, illustrate the opportunities afforded by initiatives of this type. Examples include free digital platforms and educational resources (such as [Sésamo](#), which has created free educational content for distribution in the region, see Box 3), the donation of digital devices and/or robots for the development of students' digital skills and alliances with telecommunications companies for free access to educational content.

20. Fiscal spending to address the crisis caused by COVID-19 averaged 8.5% of GDP (although two-thirds of the region's countries implemented more modest packages equivalent to around 3% of GDP) and fiscal deficits rose by an average 5.3% of GDP in 2020 (to 8.3% of GDP, up from 3.0% in 2019) while public debt increased from 58% of GDP in 2019 to 72% in 2020 (Cavallo and Powell, 2021).



10



EDTECH ECOSYSTEM

Effective hybrid models cannot be implemented without developing and strengthening EdTech ecosystems. This, in turn, calls for cooperation between governments, the private sector and civil society. The educational community as a whole must recognize the need to transform education systems in order to provide better-quality inclusive education that can prepare the region's children and young people for the twenty-first century.

To foster the development of a high-impact digital education ecosystem, it is vital to promote strategic dialogue among the region's education authorities in order to share good practices and experiences and define strategies and action plans on central issues for hybrid education, such as difficulties in access to connectivity and devices, teacher training, new pedagogical practices and curriculum adaptation. Cooperation is key for addressing the challenges that educational transformation entails, a field in which the participation of private companies, families, teachers and civil society organizations (CSOs) is essential to accompany governments in transformative processes.

In addition, to strengthen EdTech ecosystems, innovative ways must be found to resolve the challenges and problems of the implementation of hybrid education in LAC. The same vision, which guides the conception of innovative hybrid education models that maximize the use of technology in education, must be reflected in the tools and mechanisms used by governments in seeking solutions to the emerging challenges of education systems. Collaboration and interaction between companies, governments, investors, international organizations, citizens and academic entities are essential if public institutions are to have the best tools to solve the complex problems they face.²¹

Specifically, startups can play a leading role in innovation in educational solutions. Examples include the experience of the Education Secretariat of the State of Minas Gerais in Brazil which, together with IDB Lab and the MindCET company, set a challenge for the development of a solution to help reduce secondary school dropout. Initiatives of this type serve as a bridge between governments and innovative companies, which can play a key role in using technology to solve problems.

21. See <https://blogs.iadb.org/ciudades-sostenibles/es/las-soluciones-innovadoras-llegan-a-lo-publico-los-nuevos-ecosistemas-govtech/>.



E . Conclusions and next steps

LAC countries have a unique opportunity to transform their education systems, adapting them to the needs of the twenty-first century. Hybrid education models offer great opportunities to improve access to education and its quality and narrow the learning gaps that exist in the region and have been exacerbated by the COVID-19 pandemic.

The modular framework for the implementation of hybrid education models proposed in this technical note, seeks to promote the development of flexible hybrid models tailored to each context whilst, at the same time, establishing the minimum modules necessary for the effectiveness of hybrid education in its different modalities. This modular framework invites each country or education system to select and combine the modules best suited to its context and needs and, in this way, develop its own roadmap for the implementation of hybrid education.

From this standpoint, it is paramount to create and strengthen national educational networks for the co-creation and adaptation of hybrid models through which educational authorities can identify the aspects that need reinforcement and potential solutions to be contextualized and adapted successfully in line with its educational needs. In addition, it is essential to promote spaces for exchange and cooperation between governments, the private sector and civil society organizations, that permit the establishment of good practices and innovative solutions adapted to the needs of hybrid education in LAC.

The closure of schools in response to the pandemic, emergency remote education and the process of gradual reopening, with the incorporation of emergency hybrid models, have had a disruptive effect on education systems around the region. By designing and implementing pilot projects that promote innovative, flexible and high-quality hybrid education models, adapted to scale in different contexts and education systems and with a strong focus on the most vulnerable population, it will be possible to capitalize on the lessons learned, optimize the process of accelerated digitization and achieve sustainable progress towards the transformation of education in the medium term, based on the documentation and evaluation of these experiences.



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