

**EDUCATIONAL TECHNOLOGY
AND INNOVATION IN THE
CONTEXT OF THE PANDEMIC:**

Lessons Learned

Working Group on Innovation and Technology in Education

© 2021. Inter-American Dialogue.

First Edition.

Inter-American Dialogue

1155 15th St. NW, Suite 800 Washington, DC 20005

Tel: + 1 202-822-9002 / Fax: 202-822-9553

Email: education@thedialogue.org

Front cover image: Phil Roeder <https://bit.ly/30DZPQg> (CC BY 2.0)

Back cover image: Nenad Stojkovic <https://bit.ly/3hu3Q0l> (CC BY 2.0)

Layout: Daniela Saez / Inter-American Dialogue

This report is a product of the Education Program at the Inter-American Dialogue. The views and recommendations contained herein are solely the opinions of the authors and do not necessarily reflect the consensus views of the board, staff and members of the Inter-American Dialogue or any of its partners, donors, and/or supporting institutions. The Inter-American Dialogue is a non-partisan organization deeply committed to intellectual independence, transparency, and accountability. While donors are encouraged to participate in Dialogue activities, they do not influence our work in any way. Financial supporters have no control over the writing, methodology, analysis or findings of the Dialogue's research efforts.

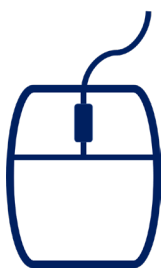
INTRODUCTION

Prior to the Covid-19 pandemic, the incorporation of technology into the educational sphere was limited, largely focused on equipping schools with computers and other hardware, rather than fundamentally changing the traditional learning methods in the classroom. As a result of the conditions created by the coronavirus, many countries in the region were forced to accelerate the incorporation of technology in the education sector on a previously unimaginable scale. This crisis has put not only technology, and access to it, at the center of public policy debates in education in the region but has also generated an opportunity to rethink the technology agenda in education, and to initiate change and investment in order to make the qualitative leap that the region aspires to achieve for its educational systems.

The mission of the **Working Group on Technology and Innovation in Education** is to contribute to the creation of an ecosystem of educational innovation in which actors from the public and private sectors collaborate effectively to produce and implement educational innovations at scale. Taking into consideration the conditions that all countries of the region are experiencing, the Inter-American Dialogue

convened a meeting of the Working Group on June 24, 2020, to discuss the challenges that have arisen due to school closures, as well as the strategies and opportunities for technological and educational development in the region that have emerged in the face of the pandemic.

The Working Group's discussions demonstrated that, although the crisis initially took the governments of the region by surprise, many have managed to develop innovative solutions to address the obstacles that emerged during the pandemic. At the same time, to the extent that advances stemming from strategies developed to confront the crisis can be sustained, these advances will allow for continued progress in transforming education through the appropriate incorporation and use of technologies, rather than a return to traditional, solely in-person educational practices. To contextualize the conditions produced by the pandemic, the Dialogue invited several national education authorities to discuss the current situation in their country and the policies they have implemented. The following is a summary of the meeting "Educational Technology and Innovation in the Context of the Pandemic: Lessons Learned."



THIS CRISIS HAS GENERATED AN OPPORTUNITY TO RETHINK TECHNOLOGY IN THE EDUCATION AGENDA AND TO INITIATE CHANGE AND INVESTMENT IN ORDER TO MAKE THE QUALITATIVE LEAP THAT THE REGION ASPIRES TO ACHIEVE FOR ITS EDUCATIONAL SYSTEMS.

COUNTRY CASE STUDIES

The Working Group meeting included detailed presentations by the Minister of Public Education of Costa Rica and the President of Plan Ceibal, as well as the participation of those responsible for educational technology and innovation in the Chilean, Colombian, Mexican and Peruvian Ministries of Education.

Costa Rica

Virtual learning and the development of educational technology is a topic that Costa Rica has worked on extensively for the past few years. However, the Covid-19 crisis revealed that there was still much to be done to build a distance learning system that reaches all students in the country. Among the efforts that the government supported during the pandemic, the development of virtual platforms necessary for distance learning, extensive teacher training and the expansion of connectivity in the country stand out.

The main goal of the Ministry of Public Education (MEP) was to preserve learning and, in particular, communication between teachers and students during the school closure period, which took effect on March 6. An initial diagnostic effort revealed that only half of the students had access to both devices and connectivity at home, less than 20 percent had devices but no access to connectivity, and the rest (slightly more than a third of students, mostly located in rural areas) had no access to devices or connectivity. Based on this data, the MEP used the Educational Center Management Information System (SIGCE) as a mapping tool to track the donation of devices to students without access. At the same time, to maintain engagement between teachers and students, the ministry set up more than one million email accounts for students and trained teachers on the use of various platforms that could facilitate this interaction. They managed to connect 90 percent of teachers to Microsoft Teams and trained a large percentage of educators on virtual pedagogical content accompanied by a guide called "Autonomous Work."

However, the biggest challenge now is to connect more than 50 percent of students to available educational platforms. To respond to the connectivity gap, the Minister

highlighted the need to form alliances with other actors within and outside the government, specifically mentioning the close relationship with the Omar Dengo Foundation, an NGO specializing in education and technology issues. In collaboration with other ministries, the Ministry of Education launched the "Connected Homes" initiative, which resulted in the donation of technological devices such as computers to thousands of students. Additionally, through collaboration with telecommunications companies, the Ministry was able to distribute free SIM cards with pre-paid cellular data access. In the future, two areas of work required to close the connectivity and access gaps are: (1) comprehensive mapping of information on vulnerable populations and the technology gap, and (2) integration of technology systems and creation of electronic enrollment numbers for effective monitoring, as well as prevention of dropouts in at-risk populations.

Another important challenge is the return to in-person classes. Costa Rica plans to reopen schools to teachers and students in September¹. The Ministry has implemented a series of protocols within the framework of a "Return Strategy," which includes mapping and filtering basic infrastructure in schools, training and assistance to teachers, and the design and dissemination of a reopening protocol document.

Currently, Costa Rica is deploying the first phase of a new platform called the System of Basic Administration of Education and its Resources (SABER), which has multiple functions such as the compilation of reports and statistics, as well as protection mechanisms for personal data and student records. Along with this new platform, Costa Rica will continue working to improve other learning guides so that teachers and families have pedagogical content to support virtual teaching. Another area they will continue to develop is partnerships with the private sector, such as telephone companies, to close the country's connectivity gap. Although the pandemic has taken Costa Rica by surprise and revealed deficiencies in the country's connectivity, technology has been an indispensable tool to identify areas of support and begin to close the access gap.

Uruguay

Uruguay has one of the highest connectivity levels in the region, as well as years of technological expansion in education. However, the Covid-19 crisis revealed gaps and challenges similar to those in Costa Rica. There is still a significant connectivity gap: only 76.6 percent of Uruguayan students have access to computers at home (this percentage varies by age of students and family income quintile).

The strategic focus of Plan Ceibal during the crisis, similar to that of the MEP in Costa Rica, was to ensure continued engagement between teachers and students through a combination of teaching methods and mediums. These platforms include television, radio, and online resources within the Ceibal en Casa (Ceibal at Home) framework. In collaboration with telephone companies, Plan Ceibal negotiated free or reduced cost data plans for students in order to ensure the continuity of educational data transfers. Plan Ceibal also created software to manage more than 100,000 deliveries of electronic devices to families. In addition, Plan Ceibal has developed integrated virtual platforms organized by educational level and has registered more than 700,000 active users among students and teachers. In parallel, teachers have been trained to use these platforms effectively, and Ceibal has opened access to a variety of educational platforms such as a digital library with more than 7,000 titles and open resources for students of all ages, as well as tutorials, consultation services, and guides for distance learning. Finally, Plan Ceibal has shared resources for social-emotional support to families and students.

To address the connectivity gap, Uruguay adopted a response framework based on combined methods to address issues identified in an extensive mapping of platform and data use. The aim of the framework is to change the binary narrative on technology in education (i.e., the only two options are face-to-face classroom learning or distance education), and to start understanding the potential of blended methodologies. To implement this new strategy, pedagogical content for radio and television has been created as an integral part of a transmedia curriculum, and not simply as a substitute exclusively oriented to communities without internet access. Other transmedia formats have also been used, with applied pedagogical programs such as *Primaria Tiempo de Aprender* or *C+*, which features a famous YouTuber as well as a well-known gamer. Although Uruguay has a larger connectivity infrastructure, the pandemic demonstrated that there was still much to be done to operationalize a nationwide

distance learning system. This combined methods strategy enables the creation of a learning system that is flexible to different contexts.

Uruguay has been one of the first countries in the region to open its public schools utilizing a blended model, keeping all the above-mentioned multi-channel strategies in place to effectively support this new learning model.

Other Countries

The Costa Rican and Uruguayan cases highlight opportunities and challenges in the region to ensure educational continuity and maximize the long-term advances made. Government representatives from Chile, Colombia, Mexico, and Peru also presented innovative components of their countries' strategies to address the crisis.

Plan Ceibal, utilizing the Ceibal en Casa framework, has developed integrated virtual platforms organized by educational level and has registered more than 700,000 active users among students and teachers.

Chile, due to its decentralized school system, developed a different strategy for supporting education in comparison to many of the other countries in the region. The Ministry of Education has not mandated the use of a single tool or platform for distance learning and has instead enabled the use of multiple options so that schools can choose the system that best suits their context and needs. The ministry has focused its efforts on creating the conditions to support distance learning, either by improving connectivity and access to online resources or by identifying distance learning platforms and resources for teachers and families. Although the Ministry considered setting up its own platform, they ultimately decided to opt for promoting the use of existing platforms known for the quality of service, such as Microsoft and Google. At the same time, the Ministry has worked extensively with national and international technology companies to determine which resources to make available to teachers.

Colombia, similarly to Costa Rica and Uruguay, has been working for many years to incorporate technological tools in education. Through these efforts, Colombia has been investing in teacher's professional development and training on Information and Communication Technologies (ICTs). In recent years, more than 50 percent of teachers have received diplomas and training in the use of ICTs. To respond to the coronavirus crisis, Colombia has implemented a series of strategies under a pre-existing framework on educational technology that was deployed two years ago. Within this framework, the Ministry promoted collaborations with the High Council for Digital Transformation (Alta Consejería para la Transformación Digital), and established an alliance with public media systems to disseminate school materials on television and radio, as well as to support the delivery of devices to the families of students in need.

Peru plans to distribute one million tablets to the rural population in the lowest two income quintiles. This effort will both narrow the connectivity gap and give students access to Aprendo en Casa programming.

In addition, collaboration between telecommunications companies and the government to provide select services free of data consumption charges has been essential to expanding connectivity coverage in the country. This strategy has been crucial in ensuring the continuity of learning, especially given that the biggest challenge for Colombia is internet connectivity, with only 50 percent of households online.

In the case of Mexico, the Aprendo en Casa (Learn at Home) initiative, developed by the Secretaría de Educación Pública (SEP) to secure the immediate continuation of education since March 23, was highlighted. As is the case in Uruguay, the government believes that a combination of methods is crucial to address gaps in coverage. Within the Aprendo en Casa framework, there have been four main initiatives to support student learning: (1) distribution of 1.8 million textbooks, (2) educational programming on 36

television channels (for primary and secondary schools), (3) radio programs in various indigenous languages, and (4) creation of virtual platforms integrated with educational content. Furthermore, the SEP expects to train over one million teachers on the use of ICTs and will also offer free courses for parents and teachers. In addition to the connectivity gap faced by many countries in the region, the Mexican government has had to take on challenges associated with a larger and more decentralized education system. For example, Mexico has 25 million students in basic education spread across more than 230,000 schools. Given this context, of all the strategies implemented by the government, the use of public and private television networks has made it possible to extend coverage to the most remote populations.

In the case of Peru, the government has taken immediate action with the launch of the Aprendo en Casa (I Learn at Home) strategy, which includes an integrated virtual platform, as well as daily open-signal television programming, and content on more than 50 radio channels that broadcast in more than 10 native and indigenous languages. Peru has over 6 million students and the biggest challenge, common to all countries, is access for students in rural areas.

A recent country analysis showed that there is also a significant connectivity gap, which is why a new digital educational framework was developed based on three components: (1) a pedagogical strategy that focuses on the student and autonomous learning, (2) access to the necessary technological infrastructure for all, and (3) strengthened teacher training. Within this framework, the government plans to distribute more than one million tablets to beneficiaries in rural areas and those belonging to the two lowest income quintiles in urban areas. More than half of these tablets will include connectivity chips and 200,000 will also include solar batteries. This effort would likely both narrow the connectivity gap and give students access to Aprendo en Casa programming, as well as facilitate monitoring and evaluation of learning. In addition, this new integrated framework will allow strategies implemented during the pandemic to support student learning on a sustainable, long-term basis, even after students return to classrooms.

LOOKING TOWARDS THE FUTURE: LESSONS LEARNED

Countries' experiences implementing distance learning strategies during school closures offer important lessons for the future, not only for emergency situations such as those experienced recently, but also more generally for the use of technologies to enhance a long-term educational transformation.

Defining an Approach to Remote Learning

The main lesson that emerged from the experiences of the countries in the region during the Covid-19 pandemic is that to be effective, the application of educational technologies at scale requires: (a) the use of a multimedia approach and (b) the design or adaptation of integrated digital platforms to present and mediate a curriculum, and which connect actors across the system, including teachers and students.

The main objective for all countries and groups involved has been to maintain communication between students and teachers as an alternative to the in-person education model. Alternatives to traditional, in-person learning, however, cannot depend exclusively on digital media. Rather, to achieve maximum national coverage, it is necessary to combine various digital and analog, interactive and non-interactive media tools, including traditional channels such as television and radio. On the one hand, a purely virtual strategy would leave many students outside the educational system if they do not have internet access or the necessary devices to participate in a virtual classroom. On the other hand, a transition to virtual education without adapting pedagogical methods can compromise the level of attention and motivation of many students. Therefore, it is important to offer alternatives that better respond to various learning styles. The diversity of methods is also important to accommodate home conditions, since the ability of responsible adults to accompany and guide the students' learning is another factor that also determines which learning tools will be used.

A potentially unexpected effect of this unusual period of large-scale distance education, is the reevaluation of the existing analog platforms and networks, which

will be especially important for the future of hybrid education systems. At the same time, the extensive use of applications such as WhatsApp and other non-mediated channels for communication between teachers and students, suggests that these should be incorporated and optimized in future educational innovation strategies. The interaction of various channels (including social networks, such as Facebook and WhatsApp) has expanded the spaces for learning during the crisis and should have a more permanent role, even during normal school operations. Of course, the use of such platforms requires the development of privacy regulations to ensure the protection of student and teacher information.

Within this multi-channel approach, the development of effective digital learning platforms continues to be a central strategy for members of the Working Group. Some of these platforms serve as gateways to resources or pedagogical materials mediated at the national level, such as *Aprendo en Casa* (Peru), *Ceibal en Casa* (Uruguay) or *Aprendo en Línea* (Chile). In some cases, the communication element is integrated into national learning platforms, and in other cases, ministries have adopted and adapted other digital platforms to maintain the relationship between students and teachers. Platforms such as Google, for example, integrate different applications that allow communication between teachers and their students through Google Hangouts, Google Drive or Google Classroom. In Chile, the Ministry of Education recommended the use of Google and Microsoft because they knew it would work well and provide different options for teachers to instruct, share assignments, and communicate with students through a single portal.

Digital platforms, whether for communication or for distributing curricular resources at the national level, must also be intuitive for all students and teachers. To this end, several members expressed a tension between using a single national platform and offering several platforms and programs. On the one hand, there is concern that a large number of available platforms and programs may sometimes overload users with information. In addition, a single platform may facilitate monitoring and evaluation

of students, if that is an integrated function. On the other hand, promoting several options gives teachers and educational institutions the autonomy to choose according to their needs and/or skills. In the case of Argentina, at the beginning of the pandemic, an attempt was made to have all schools and educational institutions use a single platform for e-learning, but this did not prove to be an effective initiative. Currently, educational institutions in Argentina are using different platforms and technologies (MS Teams, Zoom, Google Hangout, etc.), and can choose the platform according to their needs and uses.

The effectiveness of using one or several platforms seems to depend on the national context, the structure of the educational system (centralized or decentralized), and the educational level of the students using the platforms.

Addressing Bottlenecks

Beyond the diversity in countries' starting points, there are some general obstacles that all countries face, to a greater or lesser extent, when trying to scale-up distance learning initiatives. The most relevant bottlenecks observed in the region include connectivity and required devices, a lack of training and support for teachers in ICTs, and an underdeveloped digital culture coupled with the lack of inter-ministerial, regional or international collaboration. These also constitute a set of prerequisites that all countries must meet for the effective implementation of long-term approaches to the incorporation of technologies into educational processes.

The inequities in connectivity and accessibility of devices have been presented as issues in all countries. Initially, the difficulty was implementing the necessary real-time mapping to assess these gaps and to develop initiatives such as device sharing, collaborations for free, or reduced-cost data plans. Even countries such as Costa Rica or Chile, known for having good information systems, did not have basic diagnostic data on their students, their connectivity levels, the situation in their homes or the physical facilities of the schools. As a result, it has been very difficult to implement early warning systems to detect students who are not participating in virtual classes, and whether they have access to devices and connectivity, for example.

Based on past reports, we have learned that effective strategies in closing the connectivity gap consist of several key elements. First, there is a need to build better information and data mapping systems to identify the

level of coverage in schools and households. Second, for initiatives developed during the pandemic to be sustainable over the long-term, these strategies must have a clear, national-level and innovative approach that includes combined methods in order to achieve the greatest coverage.

Connecting the majority of households using traditional methods would require a large-scale investment and extensive resources and time. Therefore, a combination of alternative methods immediately connect remote areas and provide long-term investment in the country's infrastructure would result in a greater increase in national coverage. These alternative methods could include TV white spaces, Loon's WIFI-providing balloons (project Loon), or connection via cell phones or satellite dishes, among others.

The lack of teacher training in ICTs is also a major challenge for the countries represented in the Working Group. In some cases, such as Costa Rica, the initial mistake was to assume that all teachers were at the same level of development in terms of their technological capabilities or had completed the same number of trainings, when in fact, this was not the case. Colombia, among many other countries, has been developing an initial and continuous training framework with curriculum modules focused on ICTs for all its teachers. However, the pandemic highlighted the variability that exists in the levels of skills and familiarity with these resources. Several countries have reinvested in the development of a digital and technological culture in education, which will be essential to tackle the current crisis and the future of education. Within these frameworks, most have offered a number of trainings and courses to their teachers during the crisis by various means and in some cases, in collaboration with private or telecommunication companies. Additionally, the mapping of teacher training needs will be essential to effectively plan the necessary initiatives and skill-building workshops.

Finally, inter-ministerial coordination at the national level has been of great importance in order to implement effective educational strategies during the crisis. For example, the MEP in Costa Rica has collaborated with several ministries to advance the distribution of devices and to expand access to connectivity. In Colombia, the alliance with the High Council for Digital Transformation resulted in several strategies to disseminate educational material through television and radio, and to distribute devices. In many contexts, collaboration with ministries and health departments responsible for ensuring access to basic needs

for students and families will be of greater importance in closing the learning gap that has intensified among the most vulnerable populations during the pandemic.

Future Strategies

To address the challenges presented above, countries need to develop strategies that include (a) strengthening educational leadership at the ministerial level, (b) building partnerships within and outside ministries, and (c) regional and international collaboration. All of the successful experiences presented by participants in addressing the pandemic crisis included at least one of these components. In several countries, strengthening leadership or partnerships within and/or outside the country has also helped to improve strategies that were not initially successful.

When it comes to leadership, a number of countries identified a tension between the need to solve immediate problems caused by the crisis and the need to maintain the already established long-term plans within the educational agenda. To resolve this conflict, leadership focused on simplifying and adapting existing models to the current situation was called for, as well as rethinking the validity of certain models that had already been implemented. In the case of Costa Rica, education authorities developed a detailed plan for a clear and early response. First, deficiencies in the previously developed models were assessed with extensive data mapping. Then, several steps were taken to respond to the identified limitations and resources were provided for training, connectivity and monitoring within the Respuesta Temprana (Early Response) framework. Without a clear vision or leadership, it is difficult to focus efforts on concrete initiatives that address challenges quickly and effectively. Furthermore, strong leadership will be essential to institutionalize and integrate changes and lessons learned from the crisis into future plans.

Second, it has become clear that it is not possible to implement a distance learning plan on such a massive scale in a limited time without the cooperation of different sectors of government and collaboration with private organizations. Certain key services are needed to ensure

constant interactions between students and teachers, such as access to connectivity or TV programming, which tend to be provided by private sector actors. Clearly, maintaining a collaborative relationship with telecommunications companies can accelerate and contribute to a much higher level of connectivity in classrooms and throughout the country. For example, through partnerships and close ties with the state-owned telephone company Antel, Uruguay developed a connectivity infrastructure expansion plan that prioritized school areas in its plans long before the pandemic. Currently, ensuring internet access at home, and not just in school zones, is even more essential and requires close partnerships with companies and providers. At the moment, Uruguay has the highest level of connectivity in the region, which has been very helpful in dealing with the effects of the pandemic.

Based on these experiences, many countries in the region are seeking to form collaborations with telecommunications companies to accelerate the transition to e-learning. In the case of Peru, these collaborations have resulted in the development of a plan to provide SIM card tablets with free data uploads that will allow students in rural areas to connect to the internet and continue their classes at a distance. Without these collaborations, the Peruvian government would not be able to provide a service of this magnitude quickly enough.

After listening to all the valuable experiences of the different countries represented, the Working Group concluded that it is imperative to promote and expand spaces like this one, with the objective of not duplicating efforts, but rather to exchange information on best practices that could be adopted within the context of each member. Just as communication in the countries' governments has been of great importance for the development and implementation of innovative strategies, having a space for regional collaboration is enormously necessary to continue advancing the technology and education agenda together. These spaces can also introduce the region's governments to innovative private sector initiatives and promote collaborative opportunities that serve to support and accelerate the agenda not only during the pandemic, but also in the long-term.

ENDNOTES

1. The plan for returning to school has been delayed and will commence in the first quarter of 2021.

WITH THE SUPPORT OF:

AT&T Foundation



ANNEX

Participants List

Lucía Acurio

Executive Director
Grupo EduTec

Elena Arias Ortiz

Education Specialist
Banco Interamericano de Desarrollo

Luciano Braverman

Senior Director of Education
Microsoft Latin America

Lidia Camacho

General Director
TV Educativa, Mexico

Martha Castellanos

Academic Vice Chancellor
Fundación Universitaria del Área Andina

Julián Cristia

Lead Economist
Inter-American Development Bank

Giselle Cruz Maduro

Minister
Ministry of Public Education
Costa Rica

Íñigo Fernandez

Chief of Public Policy, Mexico and
Central America
Facebook

Ariel Fiszbein

Director, Education Program
Inter-American Dialogue

Leandro Folgar

President
Plan Ceibal

Arantxa Guillén

Policy Programs Manager LATAM
Facebook

Robert Hawkins

Senior Education Specialist
World Bank

Anna Herrero

Research Associate, Education
Inter-American Dialogue

Mariana Maggio

Academic Program Manager
Microsoft Latin America

Sebastian Marambio

Director of the Center for Innovation
Ministry of Education, Chile

Diego Molano

President
Consejo Superior Fundación
Universitaria del Área Andina

Mariana Montaldo

Institutional Link
Plan Ceibal

Leda Muñoz

Executive Director
Omar Dengo Foundation

Agustin Porres

Regional Director, LATAM
Varkey Foundation

Sebastian Rodriguez

Vice President of Sales Operations
Pearson

Germán Ruiz

Executive Coordinator
Espacio Común de la Educación
Superior en Línea (ECESELI)

Paula Sacchini

Strategic Marketing Manager
Pearson

Daniela Sáez

Program Assistant, Education
Inter-American Dialogue

Mateo Samper

Chief of Public Sector Alliances
Ibero-America
Coursera

Sarah Stanton

Senior Associate, Education
Inter-American Dialogue

Gabriel Sanchez Zinny

Director of the Evaluation Unit for
Education Quality and Equity
Ciudad Autónoma de Buenos Aires

Eugenio Severin

Executive Director
Tu clase, Tu país

Diana María Silva Lizarazo

Chief of Education Innovation
Ministry of Education, Colombia

Fernando Valenzuela

Partner
Global EdTech Impact Alliance

Ricardo Zapata

Director of Innovation
Technology in Education
Ministry of Education, Peru



Inter-American Dialogue
1155 15th Street NW, Suite 800
Washington, DC 20005
202-822-9002
education@thedialogue.org
thedialogue.org/education