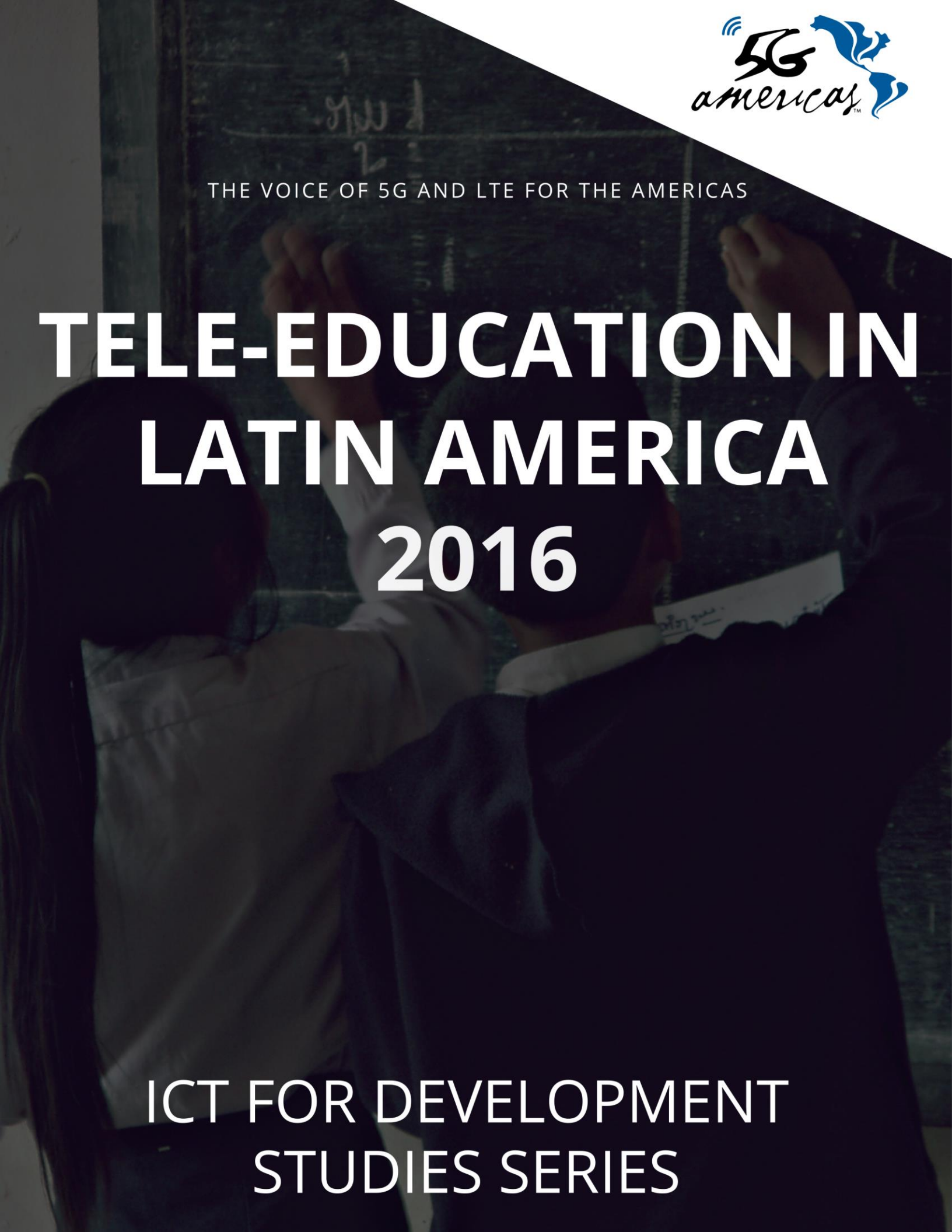


THE VOICE OF 5G AND LTE FOR THE AMERICAS

TELE-EDUCATION IN LATIN AMERICA 2016

ICT FOR DEVELOPMENT STUDIES SERIES

Contents

PROLOGUE

Latin America is a region where a wide range of realities and different sectors of society converge. Future challenges include not only bridging gaps in economic development, but in a range of other areas as well, including health, education, public safety, democratic stability and many others.

These challenges also include Information and Communication Technology (ICT) deployment. This means pushing horizontal development to drive convergence among different sectors in order to increase and improve quality of life for Latin American citizens.

BrechaCero.com was created with this goal in mind, focusing particularly on the use of wireless broadband networks. This is a blog produced by 5G Americas to promote and raise awareness for this type of ICT initiative. This open-access blog will provide information a wide range of initiatives, services and trends and look at the way technology is used to improve people's quality of life. It will also have support from a number of contributors, such as analysts and other industry representatives who will provide interviews and write columns.

BrechaCero.com will also be producing a range of documents focusing on specific issues. This will provide greater insight into how ICT is being used to drive development in different verticals and will remain available as a permanent source of future consultation.

INTRODUCTION

Latin American countries have a series of features in common. In general, the countries in this region can be regarded as emerging nations. Therefore, there are significant challenges in different aspects of society, including education, specifically the universalization of initial education and equal access to higher educational levels.

In this regard, affording equal opportunities for education is the greatest challenge for Latin America. It continues to be a shortcoming in the countries of the region, mainly because of the difficulty in narrowing the social gap in access to quality education, while the socio-economic gap also conspires against access and completion of the respective educational levels.

There is nearly total consensus on the contribution of education to greater national development and higher standards of living for countries' populations, especially since the beginning of globalization and the new production patterns that emphasize access to knowledge and information. In addition, education is considered a means for achieving equality, improving integration in multi-cultural countries and strengthening democracy.

In this scenario, the advent of Information and Communication Technologies (ICTs) in education was met by the notion that they would contribute to overcoming the challenges of the sector. The overall objective is to reduce the digital divide, to promote the modernization of learning processes and to afford greater opportunities for students. Including them in the classroom aims at achieving more inclusive social development.

Education is one of the United Nations Development Programme (UNDP)'s Sustainable Development Goals for 202o. In this case, the organization proposes to "ensure inclusive and quality education and promote lifelong learning for all" [1] and it also highlights that the overall enrollment rate reached 91% in developing regions in 2015, while the number of children who do not attend school was slashed by half.

[1] "2030 Agenda for Sustainable Development", United Nations Development Programme (UNDP). http://www.undp.org/content/undp/es/home/sdgoverview/post-2015-development-agenda/goal-4.html

According to the UNDP, the regions in need of the greatest efforts to achieve development in education are Western and Northern Africa, where armed conflicts have resulted in higher rates of children who do not attend school, while Sub-Saharan Africa achieved the greatest progress in primary school enrollment (from 52% in 1990 to 78% in 2012) among all developing regions, but with large disparity between rural and urban areas.

In Latin America, great progress has been made in including a large share of the population in initial education since 1990. According to ECLAC, the region is heading towards accomplishing the millennium goals established for 2015. The organization highlights the fact that access to education has increased at all levels, especially in initial education, which is almost universal in the region. The challenges still remaining are achieving equitable access and improving educational quality and efficiency for most markets in the region.

ICTs have reached the classrooms in in the region in a variety of ways, ranging from the development of one for each type of programs aimed at providing notebooks, netbooks or tablets to students to connectivity in schools and creating specific content and even more basic implementations such as ICT cabinets in schools.

The development of ICTs in the region has not only enabled improved educational quality due to the students' access to better tools for achieving competencies and cognitive skills, but also better administrative processes. In other words, the inclusion of technologies has ushered in institutional and academic improvements to the educational apparatus, including student enrollment, performance assessment, and many other areas.

In these cases, the connectivity of educational centers is key, and hence the importance of mobile broadband, since it can be a connectivity alternative for remote areas, thus enabling a greater scope for nationwide programs. However, to enable the favorable evolution of these initiatives, the States should create adequate conditions by providing incentives for the development of these types of technologies, not only by increasing the existing spectrum but also by streamlining regulations for network deployment.

It is important to bear in mind that education was included in many of the connectivity programs that were developed in the region during the last decade, most notably in relation to "one device per child" programs supported by providing connectivity to educational institutions. In some cases these initiatives were supported by more ambitious projects, including the creation of specific content, as well as applications aimed at creating an educational ecosystem.

The latter set of initiatives focus mainly on mobile devices, i.e. they were designed to be viewed on tablets and smartphones. This is a challenge for many governments in the region, especially regarding the massive distribution of this type of device. Latin America boasts highly developed mobile services. According to Ovum data published by 5G Americas, in 2015 Latin America had 706 million mobile lines, of which 377 million were mobile broadband (323 million HSPA and 54 million LTE lines).

According to Ovum, the growth trend for the region will continue into the future and the firm forecasts that by 2020 there will be 696 million subscribers. This large stock of mobile lines can be harnessed to develop education-related applications.

EDUCATION AND ICTS

The use of Information and Communication Technologies (ICTs) for Education implies a wide variety of aspects. These range from the use of technology for administrative issues, its application as e-learning, and connectivity and device availability in the classroom.

Within this broad concept, most countries have at least some kind of Education and ICT-related initiative. It is important, nonetheless, to have plans that bring together and order the many projects in each country so as to achieve more efficient implementation. Initiatives carried out by universities are also noteworthy. These initiatives are beyond the scope of the Executive Power and often include the use of ICTs. In this regard, the development of private initiatives also allows increasing alternatives that combine new technologies and education in the country.

Since the beginning of the new millennium, the shift from an "industrial society" to an "information society" has been described and analyzed. As part of this transition, countries that are capable of achieving and disseminating knowledge obtain further development possibilities. In other words, education becomes the key to improving countries' competitiveness, and to do so it is necessary to go beyond initial education by creating contents that encompass most of the life of its citizens.

Thus, ICTs appear as a key tool for redesigning education to meet social needs aimed at bridging the gap between disparate socio-economic realities and the education system. ICTs can be the driver of educational systems by providing universal training and learning opportunities, specifically geared at groups that have been marginalized on economic or geographic grounds, or by disabilities.

Therefore, it can be claimed that unlike traditional learning methods, education through ICTs is much more flexible and adaptable to the needs of a larger group of people. As a result, they become a great opportunity to overcome a historical deficit in traditional education: the inability to offer equal access to the different social strata.

According to UNESCO[2], ICTs can contribute to extending learning opportunities to broader and more diverse populations. They also cut across cultural, social and geographical barriers, enhance teaching and learning processes, reinforce the control of educational quality and improve institutional management.

As things stand, paying attention to social changes associated to the technological revolution becomes key for education, since it has radically changed human relations. As explained before, access to knowledge and the capacity to produce it has become a key aspect of countries' development. Besides, these changes have a direct impact on the new generations, the so-called digital natives, who have created new ways of communication, entertainment and socialization, forcing schools to modernize and leave 19th Century paradigms behind.

In this scenario, it is important for education to become part of the demands of the digital revolution. Countries need to adapt to changes in productive processes. The inclusion of ICTs in schools is a key step for preparing citizens to face the new production matrix.

On this point, it is important to go beyond an encyclopedic and academic education model to respond to present social demands. In other words, in addition to embracing in ICTs, educational plans should be adapted in terms of methodology and approach both for students and teachers.

Within this scope, the challenges of State agencies in charge of designing educational policies lie not only on the addition of new technologies in the learning environment but also on the seamless and consistent coordination of practices and the training of teachers for the challenges associated to the use of a new educational support and the expansion of the classroom environment.

In general, public policies associated to ICTs and education have the goal of reducing the digital divide and including the different social strata. Thus, the inclusion of ICTs has the objective of connecting the largest possible number of students to concepts related to the knowledge society.

[2] "Measuring Information and Communication Technologies (ICT) in Education User Manual". UNESCO http://unesdoc.unesco.org/images/0018/001883/188309s.pdf

According to UNESCO[3] , for ICTs to be efficiently integrated in national education systems, a combination of operational and political measures is required. The Organization lists a series of points to be taken into account:

- Having clear goals and the support of national authorities in the use of ICTs in education.

- Incentives and support to educational institutions in order to acquire ICT resources, specifically providing financing for materials, lowering taxes on ICT devices and promoting research to develop ICT resources.

- Adapting curricula to ICT contents, acquiring educational contents and software.

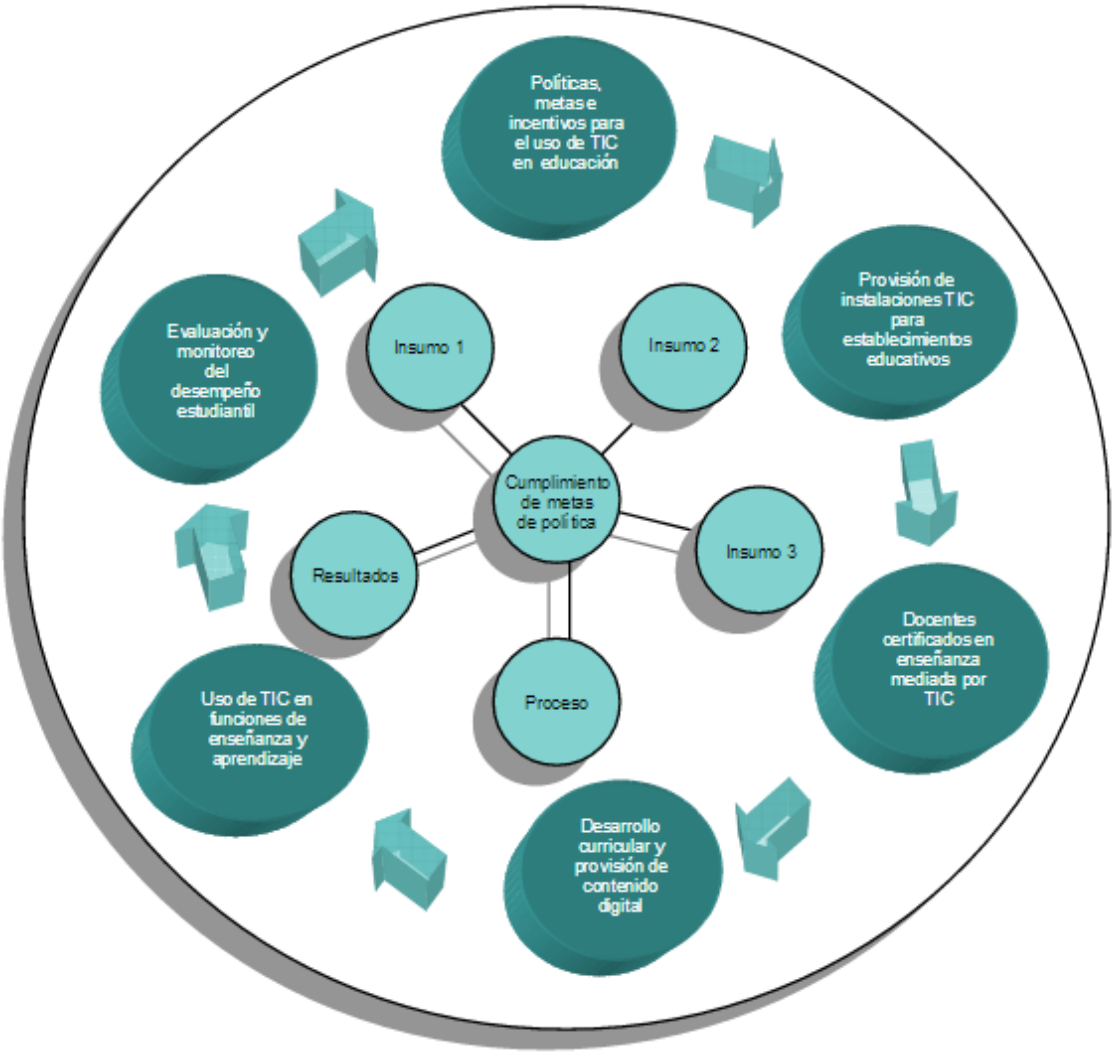
- Including ICT-related subjects in teacher training programs, or subjects related to the use of technologies in other areas. Training programs for working teachers, as well as courses for them to adapt their teaching practices to the use of ICTs.

- Flexible legislation to map out the access of students and teachers to ICT resources.

- Creating a project assessment and monitoring system to assess results and advances and to detect shortcomings.

[3] "Measuring Information and Communication Technologies (ICT) -Education User Manual". UNESCO http://unesdoc.unesco.org/images/0018/001883/188309s.pdf

CONCEPTUAL AND OPERATIONAL FRAMEWORK FOR INTEGRATING ICTS IN EDUCATION



Source: UNESCO

It is important to bear in mind that this type of project requires a major investment by the States. That is why controls must be in place to support the credibility and transparency of governments by means of reliable indicators.

In any case, national-level Education and ICT plans are not the only alternative available. There are other ways in which the new technologies make inroads in the educational field: proposals from standalone institutions such as universities, mainly through MOOC (Massive Open Online Courses).

These courses are open because access to them is not contingent on having completed the previous educational stages required to access university. Furthermore, no previous knowledge or enrollment in any of the university courses are required.

Online refers to access to the course on the Internet, which provides two major features: first, it allows students time flexibility to access their classes according to their needs, secondly the geographical flexibility of being able to access the course from anywhere in the world with an Internet connection. Lastly, they are massive because they are provided by the university with no pre-determined number of students.

This new educational model creates a new paradigm. It radically shifts the focus of this type of course. It is worth noting that developed countries have more experience with these practices while in emerging markets it continues to be a shortcoming.

This type of course also enables the possibility of delivering education on mobile technologies. The proliferation of LTE networks provides the possibility of accessing these courses not only from personal computers but also from smartphones and mobile devices, thus increasing access flexibility.

Likewise, wireless broadband networks become a useful tool to provide access to rural schools, so they should be contemplated in plans aimed at providing access to educational centers.

In other words, when States are planning to create broadband access for schools, they must take into account not only the specific Education and ICT plans but also a broad offering including facilities for the development of networks for the telecommunications industry, facilitating the conditions for developing this type of technology and allowing the mobile industry to access to the spectrum ranges recommended by the ITU for broadband service development (a total of 1300 MHz per market by 2020).

Within this framework, it is important that regulations are put forward to facilitate the development of wireless networks. It is imperative that the political decision to include ICTs in education is not limited to a macro framework for the sector but also includes the joint cooperation of many governmental areas to allow for the development of access, the deployment of physical networks and the massification of devices.

If we consider that, according to UNESCO, "the coverage from robust mobile networks is almost universal (...). This means that students who may not have access to high quality education, or even to schools, do use mobile phones". The Organization states that "far from replacing teachers and classrooms, these initiatives (...) use mobile phones to improve efficacy and efficiency"[4].

[4] "Turning on Mobile Learning: Global Themes". By Mark West. At UNESCO http://unesdoc.unesco.org/images/0021/002164/216451s.pdf

TELE EDUCATION IN LATIN AMERICA

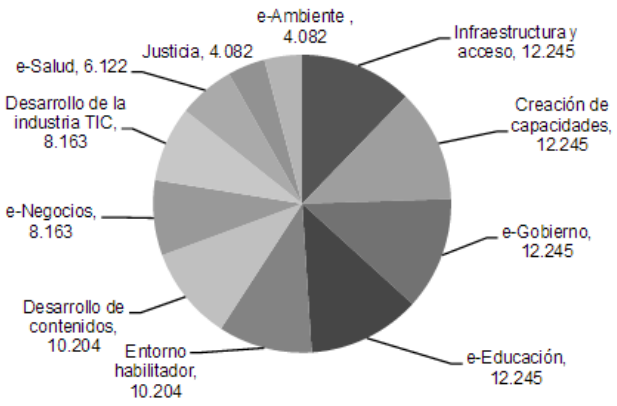
The inclusion of Information and Communication Technologies (ICTs) in education in Latin America has been mainly associated to the implementation of public policies. These initiatives have been part of projects developed by different tiers of government: national, provincial, state, departmental or municipal.

In general, the programs are part of the project driven by the Ministry of Education. The earliest experiences took place in the late 80's and early 90's, with a focus on the creation of infrastructure as a way to foster change and improve the structural conditions of education. Initially, the goal was to supply infrastructure to educational institutions, mainly by installing a room with one or more computers.

Even during the early XXI Century, the main Latin American markets implemented a series of plans aimed at increasing broadband penetration. In these initiatives, the governments had a key role, either by being responsible of the creation of infrastructure or by facilitating its development by the private sector. The goals of these plans included, many times explicitly, the creation of e-learning plans, as shown on the following chart by ECLAC[5].

TEMÁTICAS INCLUIDAS EN LAS AGENDAS DIGITALES DE ARGENTINA, BRASIL, CHILE, COLOMBIA, MÉXICO Y URUGUAY

(En porcentajes)



Fuente: Comisión Económica para América Latina y el Caribe (CEPAL), *Economía digital para el cambio estructural y la igualdad*, Santiago, 2013a, Publicación de las Naciones Unidas.

[5] "Children's Rights in the Internet Age. Latin American and New Technologies". By María Isabel Pavez. At http://repositorio.cepal.org/bitstream/handle/11362/37049/S1420497_es.pdf?sequence=1

This type of investment was considered basic to launch the process of introduction of ICTs in education. Evidence has shown that access to infrastructure must be accompanied by policies that regulate its use and educational application, sustainability and content creation. This situation led Ministries in charge of implementing these plans to create policies with goals that go beyond schools, that is to say, opening the use of technologies to the community, thus expanding its range of application and the classroom space.

In other words, the idea of bridging the digital gap was part of the main expectations that drove the incorporation of ICTs in education. The idea was to avoid a possible polarization as regards access to technology, using the educational institution as a starting point for developing these policies. This means that the school is the starting point to start bridging the many gaps that exist in Latin America.

One example from the region is Proyecto de Conectividad Educativa de Informática Básica para el Aprendizaje en Línea (Basic IT Educational Connectivity Project for On-line Learning) (CEIBAL), of Uruguay. It was launched in 2007 and set out to provide a portable computer to every student in the country under an encompassing policy seeking to add digital technology to the educational system beyond the school space. This implies that that this proposal has social as well as educational goals.

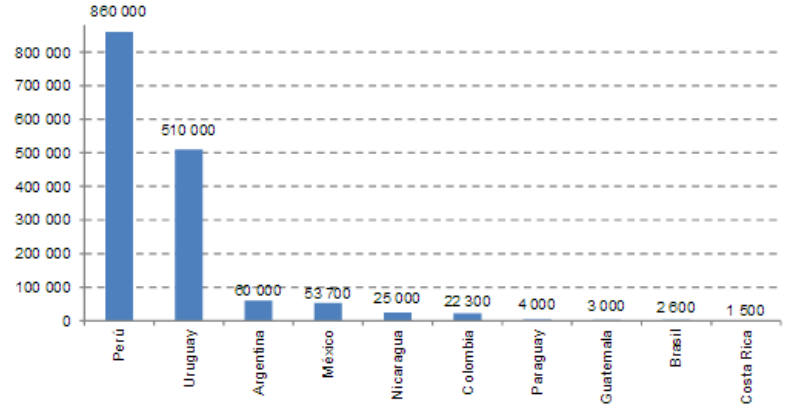
This is a flagship project as regards inclusion of ICTs in Latin America. From the educational perspective, the technology would merge with the educational proposal, so the primary goal of the supplied devices is to expand the school's action space. That was the basic notion for the plan and for supplying the computers: creating equal opportunities for students.

The CEIBAL experience was replicated by other States in the region that also chose the model known as One Laptop per Child, as shown in the following chart by ECLAC [6]. The objective of these initiatives was to make the devices available for the children so that they became familiarized with them and increased their possibilities of using technology as part of a new production system.

[6] "Children's Rights in the Internet Age. Latin American and New Technologies". By María Isabel Pavez. At http://repositorio.cepal.org/bitstream/handle/11362/37049/S1420497_es.pdf?sequence=1

COMPUTADORES ENTREGADOS POR *ONE LAPTOP PER CHILD* EN AMÉRICA LATINA

(En miles)



Fuente: Comisión Económica para América Latina y el Caribe (CEPAL), sobre la base de datos obtenidos en One Laptop per Child en febrero de 2014 [en línea] http://one.laptop.org/.

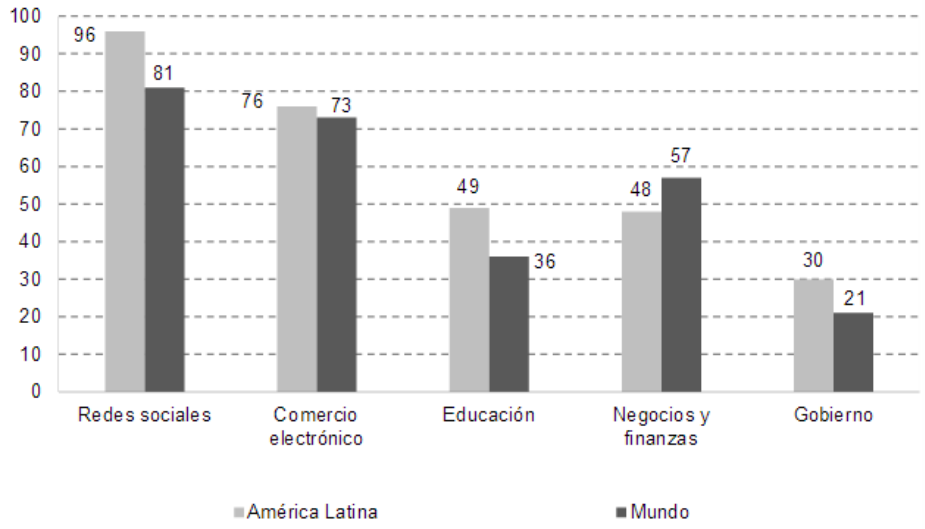
In spite of all this and of the good disposition by educational institutions to contribute to reducing the gap even outside of their natural environment, plans based on the supply of infrastructure and services were not enough, so new strategies were created for schools to try to make better use of the technologies for developing skills, especially among the lower-income sectors.

Even though the implementation of access infrastructure to educational centers and its opening towards integration with the rest of the community increases penetration in the population, guidelines must be in place to make better use of these tools. In other words, the mere access to the network does not guarantee that its use has educational or productive purposes or that they act as makers of potential skills.

If we analyze the use of Internet in the region, social media have a relevant position. This applies to all sectors of society and is one of the most relevant aspects of Latin American digital culture[7]. In a global comparison, the region uses this aspect significantly more than the rest of the world.

[7] "Children's Rights in the Internet Age. Latin American and New Technologies". By María Isabel Pavez. At http://repositorio.cepal.org/bitstream/handle/11362/37049/S1420497_es.pdf?sequence=1

GRÁFICO 2
PRINCIPALES USOS DE INTERNET EN AMÉRICA LATINA Y EL MUNDO (2012)
(En porcentajes)[a]



Fuente: Comisión Económica para América Latina y el Caribe (CEPAL) sobre la base de ComScore Futuro Digital-Chile, 2012.
[a] En la categoría 'mundo' se excluye América Latina.

However, if we analyze the use of Internet in education, the region also shows a higher level of use than the rest of the world. This fact is encouraging and creates the need to harness the potential of social media to combine it with strategies designed for education.

As part of the initiatives encouraged by ECLAC to reduce the different dimensions of the digital divide in Latin America and the Caribbean, the importance of promoting the full use of technologies by students is highlighted [8]. The goal of the organization is that ICTs contribute to improve the competencies of the country. It is also mentioned that for ICTs to be effective in learning, it is important to develop more functional and specialized skills as well as criteria for the selection and use of the large amount of information available on the web.

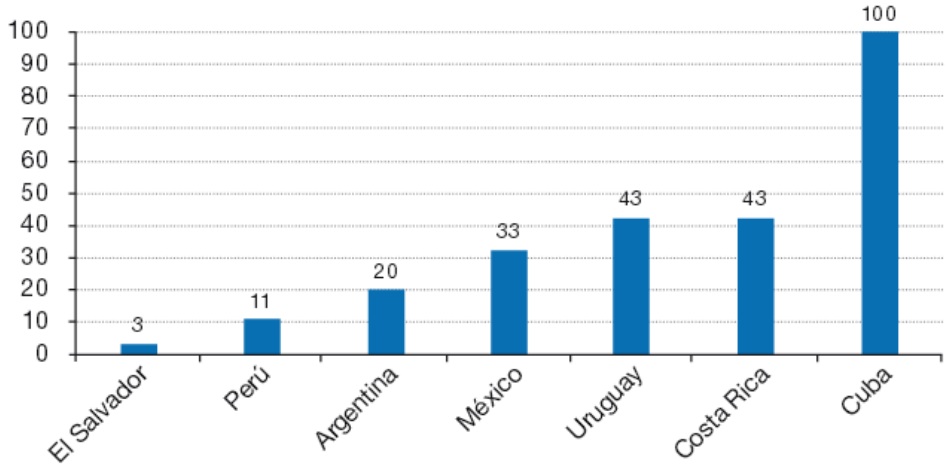
[8] "Main Guidelines for the Integration of ICT in Education. The Case of CEIBAL Plan in Uruguay". By Daniela Trucco and Andrés Espejo. At http://repositorio.cepal.org/bitstream/handle/11362/6191/S2013304_es.pdf?sequence=1

The latter task is in the hands of the school staff, who in charge of guiding and monitoring technology-mediated learning. Thus, one of the most important tasks to be implemented through this type of plan is the training and preparation of teachers to make full use of the tool's potential. According to ECLAC, it is essential to train the school staff not only on digital processes but also relative to the ability of using technology in an innovative manner through the learning process[9].

According to the Organization [10], if teachers understand ICTs, they can enhance the knowledge of a subject and help students. Therefore, it is of critical importance to implement this type of training plan. To achieve this objective, there must be specific training plans for teachers to help them use the new technologies.

América Latina y el Caribe (7 países): docentes capacitados en el uso de las TIC

(En porcentajes)



Fuente: J. E. Hinostroza y C. Labbé, "Políticas y prácticas de informática educativa en América Latina y El Caribe", serie *Políticas Sociales*, N°171 (LC/L.3335-P), Santiago de Chile, Comisión Económica para América Latina y el Caribe (CEPAL), 2011.

Nota: El Estado Plurinacional de Bolivia, Chile, Colombia, el Ecuador, Guatemala, Honduras, Nicaragua, Panamá, el Paraguay y la República Dominicana no cuentan con información disponible para calcular el porcentaje.

[9] "Main Guidelines for the Integration of ICT in Education. The Case of CEIBAL Plan in Uruguay". By Daniela Trucco and Andrés Espejo. At http://repositorio.cepal.org/bitstream/handle/11362/6191/S2013304_es.pdf?sequence=1

[10] "Integration of Digital Technologies in Schools in Latin America and the Caribbean. A Multi-dimensional Look". By Guillermo Sunkel, Daniela Trucco and Andrés Espejo. At http://repositorio.cepal.org/bitstream/handle/11362/21681/S2013023_es.pdf?sequence=1

As shown in the previous chart, the region still has work to do in the area of teachers training on ICTs. In this regard, it is important to create initial training plans for teachers but also on-going refresher courses. In addition, to ensure a smooth management of the system, it is important to appoint a coordinator at each educational institution, who will play an important part in fostering the use of ICTs in the educational institutions by liaising between the school's authorities, teachers and the new technologies.

The creation of educational content is another essential aspect of Education and ICT strategies. Its availability will enable teachers to take the leap from the book to the screen, updating and adapting their teaching practices. Within this context, education policymakers must include the production of materials specific to the new technologies.

Education portals stand out among this type of materials. They became part of educational support materials in the early XXI Century and they were deployed in all major countries in the region from 2000 to 2008. These portals evolved as each country became more digitized and their contents were updated accordingly. They have recently evolved towards the web 2.0 concept, which focuses on users and the interactivity it creates[11].

[11] Integration of Digital Technologies in Schools in Latin America and the Caribbean. A Multi-dimensional Look". By Guillermo Sunkel, Daniela Trucco and Andrés Espejo. At http://repositorio.cepal.org/bitstream/handle/11362/21681/S2013023_es.pdf?sequence=1

Portales educativos de América Latina, 2012

Argentina	http://www.educ.ar
Bolivia (Estado Plurinacional de)	www.educabolivia.bo
Brasil	http://portaldoprofessor.mec.gov.br
Chile	http://www.educarchile.cl
Colombia	http://www.colombiaaprende.edu.co
Costa Rica	http://www.educatico.ed.cr
Cuba	http://www.cubaeduca.cu/
Ecuador	www.educarecuador.ec
El Salvador	http://www.miportal.edu.sv/
Guatemala	www.mineduc.edu.gt
Honduras	www.hondurasaprende.se.gob.hn
México	http://sepiensa.org.mx
Nicaragua	www.nicaraguaeduca.edu.ni
Panamá	www.educapanama.edu.pa
Paraguay	http://www.webescuela.edu.py/
Perú	www.perueduca.edu.pe
República Dominicana	www.educando.edu.do
Uruguay	www.uruguayeduca.edu.uy
Venezuela (República Bolivariana de)	http://portaleducativo.edu.ve

Fuente: Elaboración propia sobre la base de RELPE (Red Latinoamericana de Portales Educativos RELPE) "Portales educativos latinoamericanos y el trabajo colaborativo" [en línea] http://www.relpe.org/ultimasnoticias/serie-portales-educativos-latinoamericanos-y-el-trabajo-colaborativo-publicada-por-relpe/, 2010 y "Normas para la catalogación de contenidos educativos", *Documento Técnico*, N°1, 2005.

These portals usually include materials for all the stakeholders in the educational community. However, in general the largest share is designed to help the teachers use the materials in the thematic orientation of their classes. Permanent content updating is one of the main goals that any educational policy must have in order to move toward more integral portals that can be updated as the technology evolves. Thus, it is of utmost importance that they are dynamic and scalable.

For an efficient implementation of these policies, incentives should be in place for the private sector. The mere participation of the State is usually not enough for the universalization of these strategies across all sections of the population. Within this framework, the creation of policies that enable participation of different sectors (not only education) is essential in driving the development of infrastructure, training of school staff, distribution of devices and content creation.

Thus, it is necessary to create appropriate conditions for the infrastructure deployment, facilitating not only network rollout but also spectrum availability. The latter point is important to reach coverage by wireless broadband, which enables the use technologies with farther reach at a lower cost.

Another State-driven incentive to strengthen its digital inclusion policies in the education system is the reduction of tax barriers for access devices. The availability of affordable devices is of the essence in bridging the digital divide, since the networks require terminals for the connectivity to make sense.

Tax reduction for terminals, specially smartphones, and policies aimed at facilitating access to spectrum will be important when creating mobile learning government strategies. It is worth mentioning that in Latin America these policies are still at an early stage, with some specific, small-scale experiences developed in Argentina, Brazil, Chile, Colombia, Mexico and Paraguay.

Nevertheless, according to a document published by UNESCO, "mobile learning has the potential to address specific educational needs in Latin America, from increasing literacy and basic education skills for vulnerable populations to improving the administrative management of education systems" [12]. It also highlights that upcoming policies and mobile learning programs are likely to target the mitigation of the main education problems in the region and focus on specific populations based on their socio-economic level.

The organization emphasizes that the development of mobile broadband considerably increases opportunities for mobile learning and may lead to a substantial growth in the number of mobile learning initiatives and experiences over the next few years. In this regard, it states that smartphones will play a major role for policies based on "bring-your-own-technology" (BYOT).

[12] "Turning on Mobile Learning. Illustrative Initiatives and Policy Implications". By María Teresa Lugo and Sebastián Schurmann. UNESCO. En http://unesdoc.unesco.org/images/0021/002160/216080s.pdf

IMPLEMENTING TELE EDUCATION

There are many examples of ICTs related to education in Latin America. They range from delivering netbooks to students to providing connectivity to schools, designing contents and creating specific portals. There are a series of examples in the region.

Brecha Cero will now present a series of examples that showcase the use of ICTs in education, as well as some articles in relation to the main discussions in the area:

CHILE INTRODUCES TABLETS FOR BASIC EDUCATION AT SCHOOLS

The Education Ministry in Chile, through its Enlaces program, developed the "Tablet for Basic Education" project. Its goal is providing tablets to children in the first level of transition (NT1, 4 year olds), second level of transition (NT2, 5 year olds) and first grade of municipal schools (6 year olds). The devices are introduced to foster innovation in educational practices.

The educational strategy in the project seeks to complete and support the learning experiences designed to foster logical-mathematical reasoning skills. Besides, it is geared at increasing student autonomy. Some of the main goals in this initiative are: favoring children´s inclusion and equality in information and communication technology (ICT) access and supporting teachers in mathematics teaching.

The use of tablets is children´s first experience with ICTs as well as with the mobile world. These devices follow an intuitive logic similar to that of smartphones, so that the child may adjust more easily in the future. This initiative not only facilitates the students' education process, but also helps students become acquainted with new, particularly mobile, technologies.

The plan had two previous experiences: the first was a pre-pilot phase in 2012, and the pilot phase developed by 2013. The pilot phase succeeded in improving the teaching practice, ranging from coordination needs within schools to training and optimization of educational teams.

By 2014, the project included the municipalities of regions IV, V, VI, VII, VIII and IX. These were to have at least one first-level-of-transition course (NT1), one second-level-of-transition course (NT2) and a first grade course for elementary education, totaling over 27 students in all. These institutions had to provide a teacher and a technician for young students.

The challenge in the years ahead will be providing connectivity to the program in order to enhance children´s experience with ICTs and, in particular, with the Internet. In this framework, it is important to point out that Chile's access technologies are extensively developed, with all four mobile carriers owning offering LTE networks.

In preparing for the implementation of tablets for children, each teacher received educational guidance. The proposed project will provide rotating work stations for students to interact with learning material and tablets. The suggested strategy is based on problem-solving and emphasizes different learning paces, in addition to previously acquired knowledge.

To meet these objectives, tablets include specially selected applications for the work proposed by the project. Besides, each participating institution carries 27 tablets, 9 for each one of the levels involved, as well as cases for storing and moving the tablets.

The goal of teaching mathematics stems from an objective set by the Education Ministry for promoting the development of educational and teaching proposals which strengthen public education. Besides, another goal is promoting the development of mathematical reasoning and the creation of knowledge with sense and meaning.

The Chilean government initiative highlights a significant point: a focus on primary school children. Thus, early access to ICTs in education prepares students for the future and familiarizes them with technology. It is also worth pointing out that these experiences are delivered to digital natives, so that the process of adopting the new tool develops more smoothly.

Another feature is the appointment of staff to accompany teachers in implementing the tasks to be carried out on the tablets. It is worth mentioning that one of the big challenges this type of plan must tackle relates to teachers´ adjusting to the new technologies. To this end, the plan receives educational guidance, and teachers have dedicated supporting staff.

The possibility of connecting children and teachers from different institutions to create collaborative environments which improve teaching practices is one of the opportunities the program could leverage in the future. Besides, it opens up space for a myriad of joint activities which would result in greater educational advantages. Likewise, using wireless technologies will enable a dynamic automated process for materials updating.

Enlaces Project is on its second year of implementation in Chile with the objective of introducing children into the ICT experience. Although the approach is interesting from the educational perspective, the inclusion of internet access would increase the possibilities of interaction among different educational centers. This would enhance student experience, improving their relationship with new technologies.

ECUADOR PROVIDES SCHOOL INFORMATION THROUGH THE EDUCAR PORTAL

Information and Communication Technologies (ICTs) may have different applications within the educational arena. These range from handing devices to students and teachers, providing connectivity to schools, to the deployment of on-line courses, and the development of content for the network.

One of the areas where ICTs may aid education is in enabling the exchange of information within the educational community. The interaction among principals, teachers, students and parents may be a very powerful tool to enhance the results of current educational policies. Thus, the principals may promptly communicate their educational intentions, while teachers have more agile communication, students may review their homework and assessments at home and parents may access simpler information to follow up on what their children do at school.

The Educar Ecuador Portal seeks to increase teacher performance at educational institutions. At a first stage, it is designed to create awareness and to train full-time teachers. For this purpose, they were given a netbook, a wireless internet modem of 1.000 MB per month, a mouse, a safety lock and a backpack for the recording of observations, assessments and teacher performance.

Offering wireless internet access technology is an interesting opportunity because it allows teachers to stay connected beyond the institution where they teach. This flexibility is also an incentive to keep in touch with the rest of the educational community past school hours, thus strengthening the bond with students and parents.

The plan includes a second stage for developing a networking platform with students and, ultimately, with legal representatives or families. This seeks to reach the entire educational community at each school in order to facilitate access to each individual student´s educational records.

By means of these tools, the portal seeks to facilitate follow up and control of the educational process. Creating this type of portal contributes to the continuous improvement of educational quality, since it enables the creation of easily accessible school records of student progress. Likewise, it enhances teacher qualifications and fosters ICT-enabled learning.

The Education Ministry of Ecuador is currently at the stage of registering all national educational institutions involved in the project and will next issue access credentials to each member of the educational community. This is a gradual process including principals first, teachers at a second stage and, ultimately, the rest of the educational community.

The portal allows teachers to create a register of student grades, attendance, behavior and assignments. In addition, it provides teachers with technological tools such as chats, blogs, on-line assessments, logs of study programs and scientific activities, resulting in better support material in preparing for the lessons. This initiative goes hand in hand with an ongoing process of enhancing teaching and technological skills in the classroom.

As to school authorities, the project offers the opportunity to put together institutional planning registers. Enabled tasks include allocating teachers and daily working hours, reviewing the grading reports, creating a school calendar and communication to teachers, students and families. Once this part of the program is implemented, the use of paper will be gradually reduced in school management, schools will become more nimble and access to information will be made easier.

In turn, the platform enables students to check their assignments and assessments, interact with their classmates, download learning contents and see the homework for each subject. Parents or legal representatives, in turn, may participate in the educational community, check assessment reports and homework, as well as learn about school news and request teacher appointments.

One way to expand the scope of this type of initiative is by including applications for mobile devices, especially smartphones. Thus, it is possible to reach a wider population. According to the Telecommunications Regulatory and Control Agency (ARCOTEL), by March 2016 the market had 14 million mobile lines, accounting for 86.8% penetration. Out of this total, some 6.4 million lines could also access mobile

internet services. This is evident of the fact that mobile services offer a significant access alternative in the market.

In any case, the portal is a significant step forward in educational information democratization. Its implementation becomes a way of accessing and sharing information in the school community. Thus, the platform is a tool which helps strengthen bonds and dialogue among the different players. Besides, through greater transparency of contents its goal is improving the educational quality for students, enhancing control not only by teachers, but also by students' families.

EL SALVADOR OPTS FOR ONE-ON-ONE IN EDUCATION AND ICTS

The various programs seeking to include Information and Communication Technologies (ICTs) throughout Latin America follow different approaches. These range from delivering notebooks to the students to more complex arrangements complemented with connectivity and even dedicated content.

El Salvador joined part of this plan, through the "One girl, one boy, one computer" program. The Government in that country set the goal of providing all children and youngsters at public, rural and urban educational institutions with access to science and technology. The goal is to provide equal access in rural and urban areas, eliminating inequalities, regardless of where students live or study.

The program is part of the strategic lines in the "2014 – 2019 Five-year Development Plan: productive, educated and safe El Salvador". One of the priorities in this plan is ensuring education with social inclusion and equality.

Thus, it aims at reducing digital divides and promoting equal opportunities regarding access and intensive and creative use of ICTs. For this purpose, the first step is delivering IT devices to each one of the children in public education in that country. The plan also foresees delivering these devices to teachers.

Besides reducing the digital divide, the program seeks to contribute to improving educational quality for the benefit of public school students, as well as to offer learning environments where ICT skills are developed, leading to better working opportunities.

A key point in the program is an emphasis on teacher training aimed at providing them with tools to innovate their teaching practices and contribute to educational quality improvement. Teacher training is a significant point in the program, since international experience shows that training of teachers is basic to the success of this type of program.

The device delivered to the students is called Lempitas. These devices were delivered to the Education Ministry of El Salvador (MINED) by Fundación ALBA in October 2013. Then, the State received 4.194 portable computers, which allowed for completion of Phase I, which benefitted 133 educational institutions, that is, a total of 72.497 students and 2.439 teachers.

Phase II of the Lempitas plan was carried out in the first quarter of 2015, when Fundación ALBA donated a second batch of 6.500 computers. This donation led to the materialization of Presidential Program "One girl, one boy, one computer", whose total goal is 50.000 devices by 2015 and whose objective is benefitting 84.398 students and 2.738 teachers in 571 schools.

The initiative further includes other projects. Noteworthy among them is one involving the government of the Republic of China. This project included two phases. The first one - "Bridging the Knowledge Gap (CBC-Trifinio)"- benefitted the schools in the municipalities of Metapán, Santa Rosa Guachipilín, Agua Caliente, La Palma, Citalá and San Ignacio, and was implemented from October 2011 to December 2013. The second stage- "Bridging the Knowledge Gap (CBC- San Miguel/Ahuachapán)"-was developed from July 2012 to December 2014. The third phase will focus on the districts of Cuscatlán, La Unión and Cabañas, where computers, robotics kits, projectors, UPS, electrical fittings and furniture will be delivered in 2016.

By May 2016, a total of 20.974 devices had been distributed by the programs designed to deliver a portable computer to each child in El Salvador. These were received by 781 educational institutions, 476 of which were in rural areas, while 305 were in urban areas. These schools included 391.744 students and 33.158 teachers in total. According to program data, by May 2016, 7.476 teachers from 800 educational institutions had been trained.

As far as connectivity is concerned, each public educational institution must have internet access for teaching purposes, through contract with a local service provider. To this end, the Education Ministry will receive support from the General

Superintendence of Electricity and Telecommunications (SIGET) to design, install and activate a telecommunications network to gradually connect all public educational institutions with a network administration center, where the servers providing access to content and educational software, among other services, will be installed.

With a focus on rural areas, broadband wireless access is an opportunity for the program, particularly on LTE, which enables broader coverage at smaller investment efforts depending on the frequency bands used. To fulfill this goal, collaboration with the State is necessary to facilitate the tender of spectrum bands for wireless broadband deployment. This type of initiative is important when coordinating work between public and private sectors, facilitating the rollout of networks to offer connectivity for different purposes, including education.

Initiatives to include one-on-one ICTs offer a huge opportunity for narrowing the digital divide. However, it is very important for them not to be restricted to the delivery of notebooks. In this sense, it is important for El Salvador's initiative to include teacher training, as well as assessment periods. Nevertheless, to increase its effectiveness, it is necessary to provide connectivity to schools, particularly to provide young students with better access to internet, where wireless broadband could play a fundamental role.

TELESECUNDARIA PLAN IN GUATEMALA AND THE NEED FOR A NEXT STEP

Information and Communication Technologies (ICTs) are development tools which can meet different needs in the educational field. For this purpose, several Latin American and Caribbean countries have been working on their implementation for years. In the case of Guatemala, TeleSecundaria plan has been active since 2003, after 5 years of testing. However, technological improvements will lead to greater effectiveness of the plan in the future.

TeleSecundaria was implemented by the Education Ministry of Guatemala to provide education to secondary students and young students living in locations with no available schools or inadequate educational coverage. It is characterized by having a single teacher responsible for the educational process in all the curriculum subjects supported by audiovisual media.

The initial idea for the program emerged from an agreement on distance education between the Public Education Secretariat of Mexico and the Education Ministry of Guatemala in 1996. The program was created by Ministry Agreement No. 39-98 in March 1998 and went through a 5-year experimental stage. The model was consolidated as of December 2003 with the creation of National TeleSecundaria Basic Education Institutes. By 2014, 3.200 teachers were part of the Project, from over 1.646 institutes throughout Guatemala.

One of its main objectives is meeting the demand for Basic Education in rural areas where for geographical and economic reasons it has not been possible to establish regular and technical institutes. On the other hand, it seeks to offer modern educational resources to teachers and students to develop a multiple interactive process, as well as training and technical assistance, follow-up and monitoring.

For a school to be part of the program, it needs to be no less than 5 km away from another educational institution and have a minimum population of 25 students. Attendants must prove to have completed the initial level and must be at least 12 years old. Besides, the community must have a primary school with complete educational levels.

The Project has specific methodology for students, which consists of a series of sequential activities carried out in a 50-minute session. These activities are facilitated

by a teacher who coordinates the working proposals for each one of the supporting subjects. This material consists of an encyclopedia, a study guide and audiovisual material.

TeleSecundaria plan was innovative at the time of its implementation, leveraging the technological options available then. Audiovisual methods provided adequate support for a single teacher to be able to teach different subjects and guide the students, thus favoring the inclusion of a greater number of students in intermediate education.

However, the advancement of ICTs currently allows for greater benefits both for teachers and students. The technological evolution makes it possible to produce educational video clips as well as tools for students to interact with teachers remotely. This alternative is highly significant for improving contents through student contributions.

In this sense, wireless broadband access technologies present a strong opportunity for video broadcasting in rural areas which are isolated from large urban centers. In this regard, based on data supplied by 5G Americas, the market in Guatemala had two active LTE networks by December 2015. By means of different mobile services it is possible to offer simultaneous access to several students.

Likewise, technology allows a single teacher to offer knowledge simultaneously to several classrooms. This alternative, one of the implementations most successfully deployed in terms of tele education, is of utmost importance when offering specific classes where there are no sufficient qualified teachers to teach them.

The implementation of this practice will require joint public-private work to be able to offer wireless broadband access in private areas. In seeking to leverage existing deployed networks in the market, on the other hand, it is important for the State to make the necessary effort to endow institutions with connectivity-enabled terminals.

In this sense, as has already been discussed here, it is important to appoint members of staff capable of articulating technical and educational implementation. In other words, someone in charge of solving difficulties encountered by teachers when using technology who can further coordinate daily work. Content creation is also important in this type of undertaking, which may adjust not only to the study program for each level, but also offer interaction possibilities.

Thus, the Guatemalan TeleSecundaria experience may evolve from interesting into a comprehensive new experience that leverages all the current possibilities provided by technology. The inclusion of new technologies will lead the market to greater educational development, while preparing students for the challenges they will face in the future.

SCHOOLS IN MEXICO SHALL IMPROVE ICTS POTENTIAL, ACCORDING TO OECD.

The implementation of information technologies (ICTs) at schools in Mexico did not succeed in improving student educational standards. This conclusion is derived from a study conducted by the Organization for Economic Cooperation and Development (OECD) where PISA 2012 report analyzing data from different countries around the globe.

The study "Students, Computers and Learning" stresses that investment in new technologies for education in the last decade has not necessarily correlated to better student performance at exams. The report suggests that a sound basis of traditional education is needed in addition to technology.

Likewise, it underscores that 96% of 15-year old students in OECD countries had computers at home– including portable devices, notebooks or tablets –, but only 72% reported using them at school. In this sense, the Organization points out that there is still much more implementation needed for the use of ICTs to be more effective in education.

Nevertheless, the study indicates that schools which have electronic devices and internet connection show a positive difference, albeit not significant, in PISA test results. From this perspective, within Latin America, wireless technologies could bring about an interesting differential by increasing connectivity at educational institutions, mainly in vulnerable and rural areas.

In the case of Mexico, it is stressed that only 58% of students had a computer at home by the end of 2012, which placed the country at the low end of OECD countries. However, compared with the previous study from 2009, when that percentage was 9%, it increased considerably. Among the advantaged students, (those in the 25% higher social economic status), 86% had an internet connection at home. Advantaged students spend over two hours a day on the internet, much like their peers in other OECD countries.

The report points out that roughly 61% of students in Mexico reported that they use computers at school, while over half (53%) of all disadvantaged students in Mexico have access to computers at school, but not at home, and approximately one of every three (30.4%) students in Mexico only have internet access at school.

A significant piece of data revealed by OECD research is that Mexico´s average computer use for mathematics teaching is higher than in other OECD countries. It also clarifies that students who reported frequently using computers in their mathematics class had lower performance, in average, in the PISA mathematics assessments than those who reported not using computers during lessons for that subject.

The gap increases in rural areas, where only one third (32%) of the students in Mexico had internet connection. Although over 90% of schools are located in urban areas, the other 10% faces less advantaged conditions, which could be detrimental for the future. The conditions in rural areas are an alarm signal, if we consider that approximately 15% of all 15-year old Mexican students attend rural schools and only 11% of them had internet access at home in 2012. In this sense, mobile broadband technologies are a viable alternative for including these students.

One of the highlights of the study is the importance of providing teacher training to help them integrate technology into their teaching. For this reason, there must be a curriculum in place for digital skills and teacher training. There is a need for teachers who are willing and better qualified for practices such as teamwork, personal learning and project work, which most likely require digital resources.

Finally, the study shows how in most countries the differences between advantaged and disadvantaged students in terms of computer access and internet at home was reduced between 2009 and 2012. However, typical social and economic differences persist when we consider how students use their time online: in all countries, advantaged students are considerably more likely to use their time to read news or to obtain practical information.

STUDENTS IN BRAZIL PREFER TO ACCESS INTERNET FROM THEIR MOBILE DEVICE

The "TIC Educación" survey has been carried out in Brazil since 2010. It seeks to assess the information and communication technology (ICT) infrastructure at public and private schools in urban areas for purposes of applying it in educational processes. The research is aligned with the methodological reference proposed in the recommendations of InfoDev by the World Bank and the 2006 Sites study (Second Information Technology in Education Study), by the International Association for the Evaluation of Educational Achievement (IEEA). Besides, it has the institutional support of the Education Ministry, UNESCO, the National Education Secretaries Council (CONSED), the National Union of Municipal Education Leaders (UNDIME) and experts connected to non-government organizations and major academic centers.

According to data in the "TIC Educación 2014" survey, 87% of students in Brazil have access to public urban schools. Out of those, 79% connect by mobile phones, although only 41% does it on the school network in spite of being their main access after their own home.

The study considers internet users are those who access the network at least three times a week. The study surveyed 930 schools from September 2014 to March 2015. Interviews were conducted with 930 principals, 881 teaching coordinators, 1.770 teachers and 9.532 students.

Regarding the use of mobile phones for internet access in Brazil, the market had 273.79million lines by October 2015, according to the National Telecommunications Agency (ANATEL). Of that total, some 165.2 million corresponded to third-generation mobile broadband devices and some 20.4 million to LTE. In other words, over half the lines of mobile telephony in the Brazilian market were enabled for mobile broadband.

On the other hand, the 2014 TIC Educación report stresses that teachers in Brazil are interested in using digital resources for their classes, although they point out that the infrastructure conditions and internet training for teaching purposes are not always available. For 30% of public school teachers, the main use of ICTs is the classroom and they are used to carrying out activities with their students.

The survey also highlights that 93% of the schools in urban areas have internet access. In the case of public schools that indicator hits 92%, while in private ones it accounts for 97%. Regarding equipment at schools, there was an increase in the share of institutions with mobile computers, reaching 79% of public schools versus 73%

recorded in 2013. In turn, the number of institutions with tablets hit 29% versus 11% in 2013.

Nevertheless, one of the main barriers to be overcome is the connection speed at educational centers. By 2014, 41% of public schools with internet connection had their main network connection running at throughputs of up to 2 Mbps. By 2013, those institutions accounted for 50% of the total. This rate is more encouraging at private schools, where 81% of all connections exceeded 2 Mbps of throughput.

Most teachers at public schools stated they learned how to use computers and internet on their own (67%), although 57% indicated that they had taken some specific training course on ICTs. Out of these, 74% had taken paid courses and 29% had received free training by the education secretariat – there was no indication of the percentage who had taken both types of courses.

Another piece of data provided by the survey is that the use of mobile devices for internet access had grown among teachers. Known as BYOD (bring your own device) the phenomenon spread among public school teachers, where 64% use their own mobile device to access networks, as compared to 36% who did in 2013.

On the other hand, the survey results show that the use of digital educational resources for preparing classes or activities with students is very widespread among teachers. According to the study, there is indication of growing interest in the use of ICTs in teaching practices. 82% of all public school teachers produce class content by means of new technologies. In turn, if we consider the use of internet for publishing or sharing own contents with the students, it is done by 28 % of the teachers in public institutions- a seven percentage point increase when compared to the 2013 edition.

Research results from the "TIC Educación 2014" report provide a picture of access and use of ICTs among teachers and students at public and private schools of basic and secondary education in Brazil. It is important to stress that the surveys on ICTs by Cetic.br are led by a group of experts, whose contribution in the planning and analysis stages renders the process more legitimate and transparent.

TIC Educación research is carried out by the Internet Management Committee in Brazil (CGI.br), through the Regional Center for Development Studies of the Information Society (Cetic.br) at the Information and Coordination Center of Dot BR (NIC.br).

NICARAGUA NOW HAS ITS FIRST FREE SOFTWARE CENTER

Nicaragua has a new free software center, which seeks to create educational applications and work in the continuous learning process improvement of Educational Program "One Computer per Child". This initiative is led by FUNDECYT-PCTEX, "Agencia Extremeña de Cooperación Internacional" (AEXCID) and Zamora Terán Foundation.

The project seeks to transfer educational resources developed in Extremadura, in addition to teacher training. The latter point is of utmost importance in terms of tele education since, as discussed before, one of the areas where most work is needed is teacher coordination and support.

However, the space not only focuses on replicating good international practices in the market. It also seeks to develop other innovative technological projects responding to Nicaragua's educational needs on the basis of educational software development and free software based improvement and innovation. This type of deployment is important to be able to adjust the Information and communication technologies (ICTs) to specific issues in Nicaragua from the educational and cultural points of view.

This type of program is already active in 20 countries around the world. The applications to be developed in Nicaragua will benefit 224.000 persons, including children, families, teachers and principals at schools.

SOLUTIONS TO THE GENERATIONAL AND DIGITAL DIVIDE IN EDUCATION

One of the outstanding discussions in educational environments when implementing information and communication technologies (ICTs) relates to the adaptation of teachers and educational institutions to a generation that grew up with technology. This was the main theme of the First Conference on Digital Education - "Teaching to Digital Natives".

The meeting took place at the Pontificia Universidad Católica Argentina (UCA), in Buenos Aires, and its discussions were based on the educational challenges posed by a new generation of students. Digital natives are currently the largest share of educational populations, a fact which changed student behavior and also the way teachers approached these different interests, multitasking skills and different sensitivity requiring new educational paradigms.

Although this generational divide is an important issue at all social levels, the concern for having reliable and secure connectivity prevailed in vulnerable areas. Thus, the technological divide in terms of connectivity still represents a hindrance, mainly in areas far from large urban centers. Even in cities, certain marginal areas have difficulties in obtaining connectivity. In this sense, LTE is a positive alternative to reduce the connectivity divide in rural and vulnerable areas. Some spectrum frequencies, such as the 700 MHz band, enable coverage of large parts of the territory, which would benefit the areas that are distant from cities.

This problem does not only affect the higher social and economic groups, where the use of smartphones is a point to be taken into account by teachers, but also among segments of lower purchasing power, where technology opens a gap between students and teachers. This relationship was the main topic of the panel "Challenges of education in the digital era", whose moderator, Dr. Jorge Ratto, Secretary of the National Education Academy, stressed the need for redefining the role of students and teachers, and for designing a new concept of teaching. He also underscored the need for a call to foster digital literacy, as well as digital culture.

In this regard, Darío Pulfer, Director of the Organization of Ibero-American States for Education, Science and Culture (OEI) in Argentina, stressed the need for education to keep providing the original literacy education while including digitization and audiovisual teaching. He indicated that this is not about opposing two different

worlds, but rather about helping them to coexist. He also pointed out the goal of schools is integrating new realities and not opposing them.

Along these lines, Gabriela Azar, Director of Education at UCA, remarked that the students' reality had changed but that education had not adjusted to the new times. She also indicated that it is essential for those changes to be reflected at the schools, since that is part of its role as an institution. However, she indicated that it is positive for Argentina to have legislation supporting digitization in education. She considered it was an advantage to have a legal framework for this purpose in place for the future.

These considerations on digital inclusion were focused on experiences in urban areas and mostly on students of middle or high social and economic backgrounds. In turn, Guillermo Buitrago, Chair of the Archdiocesan Board of Catholic Education (JAEC), presented an experience carried out in Córdoba (central province in Argentina) in 2009 with vulnerable sectors.

He described the situation of educational institutions where student access to computers stood at a 1 to 4 ratio, with devices from the end of last century. Besides, he stressed that digital education processes were out of context, to the extent that the person in charge of ICTs was not a teacher.

Buitrago explained the process he led, which meant a first step towards school digitization. He firstly explained that the focus of the work was presenting the need to authorities, showing them the proposal and the different experiences deployed throughout the country. In this regard, he explained it is essential to raise the interest of authorities in the projects, so that the latter can be completed.

Another recommendation he considered important in implementing projects was the creation of scale. Thus, he stressed it is fundamental for institutions to work jointly in order to purchase equipment collectively and thus reduce the end cost of the equipment. The next step he elaborated on was the need for an own educational platform, whose main features should be high operating speed, beyond the different options available.

Apart from these necessary points to create an ICT Project and education in vulnerable environments, Buitrago included the need to appoint a digital coordinator at each institution. The main function of this position is coordinating teachers and authorities, and the coordinator must be sufficiently qualified to train teachers and students.

The figure of the digital coordinator was highly valued by Buitrago, as well as by the other speakers, who considered it vitally important to work on improving the relationship between institutions' authorities and teachers. They also mentioned the significance of helping teachers to overcome the different difficulties they face daily with their students. Finally, mention was made of the need for secure and reliable connectivity, enabling students to enhance their ICT experience.

Connectivity emerged as the main gap between experiences in urban areas with high and middle purchasing power and vulnerable areas. In this regard, speakers agreed that it was difficult to bridge human gaps such as teacher, authorities or student reluctance. However, the issue of connectivity emerged more strongly in vulnerable areas.

It is evident that some gaps are more difficult to bridge than others. The cultural gap between the generations of digital natives and digital migrants will be solved over time and as a result of the latter´s cultural change. However, gaps such as connectivity may be solved faster, using technologies already available in the market.

LOOKING TO THE FUTURE…

Initiatives including ICT in education are widespread in different Latin American countries. They operate at different levels and seek to respond to different sectors of the educational community. Generally speaking, these initiatives are based on the deployment of infrastructure, policies of one computer per student and, to a lesser extent, the creation of educational content.

In general, the starting scenario in the region is positive into the future, not only given the momentum in all education ministries, but also because the States included the concept of tele education in their national connectivity plans. Significant efforts were also made to train teachers on the new technologies, although with varying results.

Private sector involvement is significant regarding service maintenance and the creation of contents designed to meet an important need in this type of initiatives. These points are relevant when we consider that, in general, States have focused their efforts on connectivity and provision of devices, leaving space for application and content deployment. In this sense, the supply of connectivity services is also an opportunity for this sector. However, to render it effective, greater collaboration is needed between education and ICTs through the deployment of common policies.

Policymaking aimed at including ICTs in education should consider the reality of the telecommunications sector. It is important to provide incentives for improving connectivity, mainly based on the facilitation of radio spectrum so that coverage can be fast and efficient on mobile broadband technologies. From this point of view, facilitation of spectrum in the industry is one of the strategies which would lead to improving mobile broadband quality.

On the other hand, recent BYOT trends to enhance this type of plan should be considered by the authorities, particularly favoring the sale of new devices such as smartphones. The inclusion of devices is a key point to the success of any program designed to narrow the digital divide.

High penetration of these terminals, coupled with a growing mobile broadband market, are a strong incentive for the deployment of education-centered applications. This enhances not only educational content, but also activates other related sectors, improving the country's wealth and employment levels.

In other words, e-learning calls for States to create the conditions to enhance the involvement of the private sector in e-learning initiatives. To this end, it is important to take a quality leap which includes the creation of content and applications for the sector in addition to connectivity.

In summary, existing state-run plans combining ICTs and Education in Latin America offer an opportunity for enhancing the sector. It is important for governments to embrace the help and contribution coming from private initiatives in order to create better conditions for telecommunication networks and service deployment, particularly wireless, which may enhance the growth of these programs.

ACKNOWLEDGMENTS

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2016

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