Plan CEIBAL in Uruguay

FROM PEDAGOGICAL REALITY TO AN ICT ROAD MAP FOR THE FUTURE
Plan CEIBAL in Uruguay
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**GLOSSARY**
Glossary
The progress of Plan CEIBAL shows the crucial role played at present by information and communication technology (ICT), both in the area of education and in society in Uruguay. In less than two years, XO laptops were distributed to all of the pupils in the country’s public primary schools. Access by 350,000 boys and girls and 18,000 teachers, not only to ICTs but also to new forms of education and new social environments, has meant that the country has taken a considerable step forward towards innovation. The responsible use of ICTs leads to an improvement in the quality of education, which represents the final step in UNESCO’s “Education for All” programme. High-quality education for all is at the root of scientific research, innovation and social development. The main idea of promoting social and educational development through ICTs emerged in 1967, when Seymour Papert created the Logo programming language with an educational purpose, based on the constructivist theory and children’s use of computers. However, the decisive element which made the vision of distributing one laptop to each child come true was the technological progress achieved at the end of the millennium, and the Internet.

In the global context of the “one laptop per child” initiative, the pioneering role of Uruguay stands out. It was the first country in the world to systematically distribute one laptop to every student in its state primary schools. For this reason, the vision and implementation of Plan CEIBAL in Uruguay has attracted worldwide attention.
Under the gaze of the international community, Plan CEIBAL shows astonishingly how school education can be changed radically. As the President of Uruguay, Dr Tabaré Vázquez, stated: «…this is about a revolution, inasmuch as it entails a process of profound and irreversible changes which lead the way […] to a better world, to the extent that it offers everyone a better opportunity of achieving equality before the law, but above all, the opportunity of equality for all in life, which is the most important aspect.». An ambitious implementation programme was launched; all of the stages – from the installation of connectivity, the training of teachers, the development of content to the improvement of the quality of education and the evaluation of teaching procedures – were carried out simultaneously.

Beyond its technological equipment, Plan CEIBAL is a programme which fosters social and educational development. ICTs can have a catalysing effect on education, facilitating self-learning through the discovery of new techniques, content and settings, and interaction with others on the Internet. As Dr Vázquez explained, the progress of Plan CEIBAL in Uruguay implies profound changes in the school education system – from the traditional classroom lecture methods to an environment which facilitates team learning. However, this process does not happen automatically; it requires the efforts of teachers and parents. Plan CEIBAL is not, therefore, limited to the student perspective but extends into a triangular-shaped target group composed of teachers, students and parents.

The use of ICT in school education in Uruguay requires teachers to be trained not only in the use of technology. Incorporating computers in all teaching areas, adapting the curriculum and making methodological changes are all challenges which make it indispensable for teachers to have access to ongoing training.

Plan CEIBAL is, equally, aimed at parents, who play a crucial role in the educational development of students, as well as in the construction of a modern society which knows how to make use of the advantages of ICT in electronic government, electronic commerce and interactive distance education.

UNESCO promotes the use of ICTs in education through its “Education” and “Communication and Information” programmes, creating an intersectoral platform. The World Summit on the Information Society (WSIS) (Geneva, 2003 and Tunis, 2005) and the Millennium Development Goals (MDGs) underlined the strategic function of ICT in improving the quality of education and fighting the global problems caused by poverty. The crucial role of ICTs in education was confirmed in the WSIS Declaration of Principles and Plan of Action and the UNESCO was given the responsibility of developing methodology and support guides for the establishment of a facilitating
political and institutional environment. UNESCO’s mandate is included within the framework of its objective of building knowledge societies based on four basic pillars: freedom of expression, universal access to information and knowledge, respect for cultural and linguistic diversity and access to quality education for all. By promoting universal access to information and knowledge and improving the quality of education, the use of ICTs in education constitutes an essential tool in the knowledge society. It is important to remember the vital role played by statistical indicators in measuring and improving the quality of education. Through its Institute for Statistics (UIS), UNESCO evaluates the status of the use of ICTs in school education, bearing in mind quantitative and qualitative indicators. In the future, the use of ICTs in education could be adopted as an additional indicator to measure the quality of education in the context of the Human Development Index, which would recognise education for the competencies of the 21st century.

In Uruguay, Plan CEIBAL is already showing its first creative and pedagogical effects, not only amongst students, but in the triangle formed by the three target groups: teachers, children and families. Finally, Plan CEIBAL is an example of South-South cooperation, as well as of North-South-South cooperation, in sharing this unique experience with neighbouring countries and the region as a whole, but also in learning from other approaches to the “one laptop per child” format. During UNESCO’s 35th General Conference, held in Paris in 2009, “Priority Africa” was confirmed. Plan CEIBAL provides new dimensions for cooperation with Africa, as recent collaboration between Uruguay and Rwanda has shown in the area of applying ICTs in education.

**Jorge Grandi**

An agronomist at the Technical Agrarian Institute (IPA, in Spanish), Casilda. College degree in Political Science from the University of Political Science and International Relations, Rosario, Argentina (1979). Diplôme d’Études Approfondies (1980) and PhD in Political Science with a specialization in Scientific Policy (1986), both from the Institute of Political Science, Paris, France. General Coordinator and Director of EIPA (European Institute of Public Administration) and CEFIR (Centro de Formación para la Integración Regional, Training Centre for Regional Integration). At present, he is Director of the UNESCO Regional Bureau for Science for Latin America and the Caribbean, Representative of UNESCO to MERCOSUR and Representative of UNESCO to the governments of Argentina, Paraguay and Uruguay.
This government committed itself to and carried out Plan CEIBAL. In brief, one laptop per child and per teacher, connected to the Internet, for all public schools, paid by the State. This is already important, but there is even more. The materials – computers, networks, servers, electric installations, maintenance services – constitute a support for a new experience in education and social integration. Teachers, who are now more important than ever, focus on the tasks for which they are particularly suited: shaping criteria, helping to learn and learning to learn, rather than transmitting information. The family is also included; children are often the teachers and the owners of the most precious object in the home. Children interact much more with one another, without merely waiting to receive information from the teacher. The plan is only just beginning. When all the laptops – which are carried about like books – have been distributed to all of the children, a content-creation process will begin, which entails changing educational paradigms to involve a careful evaluation of learning and of differences in behaviour. Information used to be scant, but reliable; now, the opposite is true. This government found a country whose society was painfully fragmented, where there were access gaps regarding food and health. Digital
technologies, which could have led to yet a further gap, have instead become a bridge. The education budget has increased significantly and Plan CEIBAL was undertaken. This means that it has been acknowledged that education must focus on the learner – individually and collectively – and, above all, that it is a human right.

**María M. Simon**
An Industrial Engineer, specializing in Electronics, who graduated from the University of the Republic (1980). Associate Professor at the University of the Republic, in the area of Telecommunications (1993). Dean of the School of Engineering of the University of the Republic (1998-2005). President of ANTEL (National Telecommunications Administration) (2005-2008). At the time of writing, she is Minister of Education and Culture of Uruguay.
Three arduous years have gone by since Plan CEIBAL was announced; years during which we had to make our way in every step we took, since what we were doing was new for Uruguay, and new in the world. As a comprehensive public policy, Plan CEIBAL finds its meaning in the explicit purpose of the progressive construction of an egalitarian and fairer society, with an emphasis on social inclusion. The feasibility of the plan, however, focuses on and is guaranteed by education, as this is the way people are trained and, in this case, the development of digital skills guided by humanistic criteria is promoted. Thus, a challenge confronting schools emerges; this is how tension begins to surround school teaching, knowledge and technology.

A computer, conceived as a digital resource for learning and for teaching, becomes a powerful educational tool that needs to be analysed and controlled in order to make the best use of it. State schooling and democracy go hand-in-hand, and on this occasion, it was schools that received the strongest impact generated by change. The massive entry of 25, 30, 32 laptops into the classroom led to the quick awareness that we were confronting an unprecedented event, which made it necessary to take essential and innovative measures in order to avoid improvisation. In this way, research studies, exhaustive educational and pedagogical analyses, planning and systematisation began to provide the backbone for these innovative processes. The modification of daily practices is
always the hardest part of any process of change. Nonetheless, the presence of one laptop per child modifies reality in itself, showing that the one-way direction of classroom learning has collapsed and that, at times, everyone is learning. At other times, students teach the teachers and, no doubt, the teachers also teach the children, and very often, students teach other students. However, if this change is not accompanied by systematic actions involving information, knowledge and the desire to change, all that is left is a great deal of uncertainty.

It has become very clear that students need teachers to teach them and that, therefore, teachers can change their place, but not their role, and must reinforce their leadership as promoters of knowledge, guides and validators of the pedagogical relationship. An innovation of this scale makes the ongoing training of teachers more meaningful, whatever their position in the hierarchy, which generated a new challenge: organising in-service training for the 16,000 teachers in state school education.

The most intensive activities took place in 2009, when many different forms of continuous training were carried out, particularly in the format of one trainer per school, aimed at improving curriculum practices using XOs as teaching resources.

These actions promote teachers’ professional development, which far from declining, will continue to grow as long as the needs of teachers are met, linked as they are to technological and social transformation. The first steps have been taken and the journey shall be continuous and unending, which calls for constancy, a critical and reformist attitude and the conviction that without education there are no guarantees that digital society will be any more egalitarian, or will provide a better quality of life for all. If education is key to the success of Plan CEIBAL, it is teachers who must lead it, pushing it forward and guiding it, if need be.

This book provides a collection of different views and perspectives from a variety of settings. They constitute analyses, narratives and contributions which converge to build the necessary synergy to carry out an undertaking of the magnitude of Plan CEIBAL.

Edith Moraes
Master’s degree in Education. At present, Director General of the Early and Primary Education Council.
Introduction by Günther Cyranek

As a sequel to the book CEIBAL en la sociedad del siglo XXI, (CEIBAL in 21st century society), this collection, Plan CEIBAL in Uruguay, provides updated references for parents and teachers. In addition, it provides examples of the reflections of the teaching community with regard to the implementation and progress of Plan CEIBAL. We eagerly anticipate that cooperation in the “teachers, students, parents” triangle will facilitate synergies in the creation of social networks for local development. I am grateful for the contributions and valuable cooperation of the authors, and of institutions, such as the Ministry of Education (MEC), the National Public Education Administration (ANEP), the Central Directing Council (CODICEN), the Early and Primary Education Council (CEIP), the Secondary Education Council (CES), the Council for Technical-Vocational Education-Universidad del Trabajo del Uruguay (Uruguayan polytechnic school) (CETP-UTU), the Teacher Training and Development Directorate (DFPD), the Agency for the Development of Electronic Government and the Information and Knowledge Society (AGESIC), the Technological Laboratory of Uruguay (LATU). I also wish to express my gratitude to my colleagues in three of the United Nations Agencies accredited in Uruguay, who have supported this project and collaborated with it from the start: the Food and Agriculture Organization (FAO), the International
Organization for Migration (IOM), the World Health Organization/Pan American Health Organization (WHO/PAHO).

This introduction provides guidance on the subjects and opinions expressed by the authors and the teaching community in Uruguay. The far-ranging scope of discussions regarding Plan CEIBAL over the last two years includes the synergy with the Community Teachers Programme, the new opportunities for communication, the challenges to the task of teaching, learning objects in educational portals, the consequences in Middle School, training for future and present primary and middle school teachers, telecentres and multimedia community centres for social inclusion, the attraction of video games, safe and responsible surfing, children with special abilities, the qualitative and quantitative evaluation of experiences, the words of the actors and of the teaching community.

The Plan CEIBAL Policy Committee describes the three dimensions of this plan: educational, social and technological. The strategic principles which lead to reducing the digital divide are equal opportunities for all children and the democratisation of knowledge. The aim is to improve the quality of education by mainstreaming information and communication technology (ICT) in classrooms, and in the “child, school, family” triangle. Plan CEIBAL includes primary, secondary and private education. The objective is not only democratic access to information, but also the production of local subject-matter content. In the beginning, teacher training was carried out in a “cascade” format, and later this led to the establishment of a lead teacher, a “CEIBAL teacher”, whose role is to train other teachers. The CEIBAL Portal is key for the construction of learning and the dissemination of information to the whole community. Graciela Almirón, Leticia Folgar and Antonio Romano show the partnership and synergy which exist between the Community Teachers Programme (PMC, in Spanish) and Plan CEIBAL. The aim of integrating families into the educational process through the PMC is to improve the quality of education and relationships in the “child, school, family” triangle. Thanks to Plan CEIBAL, parents want to learn
to use ICTs in order to understand and support their children in their learning process, as well as for their own benefit. Institutional relationships between school and community are changing: the community is within the school, and the school is within the community.

Mónica Báez and Graciela Rabajoli explain that the “one laptop per child” model leads to socio-cultural changes; it reduces the digital divide, promoting social inclusion and the construction of a knowledge society. In addition, it strengthens collaborative learning, which includes educational flexibility and the customisation of education. Amongst the challenges posed by the educational mainstreaming of ICT are: teaching methodology, the design of school activities, classroom differentiation and the concepts of collaborative and cooperative learning. ICT is, at the same time, an educational resource, a communication tool and a means for educational and social change in the community.

Graciela Rabajoli points to the key landmarks of Plan CEIBAL, from its early steps in Villa Cardal in 2007 to the plans for an international conference of ministers of education in 2021. The continuous exchange of ideas within the context of North-South and South-South cooperation is crucial in order to learn from the experiences of other countries with regard to “one laptop per child”. It is necessary to develop and support innovative teaching experiences and include them in the curriculum, with a view to training future and present teachers. Cooperation between inspectors, teachers and technicians, with the support of RAP CEIBAL volunteers, facilitates didactic progress; at the same time Plan CEIBAL’s educational portal provides learning objects, blogs and local content. The inclusion of parents is promoted thanks to the Uruguayan Community Telecentres Network (RUTELCO in Spanish), which includes 200 training centres, thus generating a great deal of support for children. In addition, impact evaluation analyses the educational and socio-cultural effects of the Plan CEIBAL laboratory, in order to expand its positive effects.

Graciela Arámburu describes the didactic challenge of teaching with a computer. All children have the right to quality education and it is a teacher’s responsibility to guarantee it. For this reason, it is important to ensure that the use of the computer is based on learning processes and not the other way around. Some examples of activities carried out with the XOs are: using word processors, stories with animated drawings and using the calculator. Likewise, the turtle geometry programme developed by Seymour Papert, the XO co-creator, is a fantastic tool for teaching mathematics.
José Miguel García, Dánisa Garderes Corbellini, Fabián Martínez and Mª del Lourdes Quinteros refer to the didactic material used by teachers in class. At present, digital educational material must comply with a number of innovative criteria, for example: (1) integration of hypertext to associative textual relationships, (2) multimedia combinations which bring together text, audiovisual elements and images, and (3) interactive possibilities which, according to the constructivist theory, are very important in the construction of knowledge. CD-ROMs and educational portals are the answer; they facilitate group learning processes, as well as communication and social interaction. The Uruguay Educa portal contributes to the Latin American network of educational portals designed by the ministries of education in the countries in the region. In Uruguay, the CEIBAL Portal, which contains learning objects and games, is also highly valued.

Laura Motta presents the outlook for Plan CEIBAL in Middle School. Plan CEIBAL is an invitation for people to acquire education, to construct a new community and provide a creative impulse towards a higher level of development. With a perception of the education system as a combination of socio-cultural means, families and schools, Plan CEIBAL can rebuild the relationship between society and education. Innovative education with ICT fosters creativity, critical thinking and ethical commitment, with the purpose of achieving social inclusion. In this process, XOs symbolise transformation and act as catalysts and motivators for innovation in education.
Beatriz Guinovart, Magela Figarola, Guillermo Ghelfi, Martha Varela and Sandra Ivanchuk refer to the expansion of Plan CEIBAL to Middle School in 62 schools in rural areas. The purpose of the support and academic assistance group for rural schools with seventh, eighth and ninth grades is to guide teachers in the production of scientific knowledge with ICT. In addition, it strengthens the new competencies of teachers and students. The use of ICT can promote critical scientific literacy, foster students’ self-learning and strengthen collaborative work between students and with the teacher. The diversity of teaching models is a very important factor in order to respond to different paces and styles of learning, and to the students’ various types of intelligence. According to Gardner and his multicultural concept of human cognition, the development of naturalist intelligence implies observation with all the senses, favouring the development of an
interdisciplinary mind, and the integration and communication of the perceptions of the natural and human world. Plan CEIBAL can support the development of naturalist intelligence through simulation programmes and laboratories, tutorial programmes, online libraries and educational portals. However, the use of ICTs can only contribute to modernising learning if they go hand-in-hand with educational, organisational and institutional changes.

Rosita Inés Angelo analyses the challenges posed by Plan CEIBAL with regard to teacher training. Teacher training institutions must now take institutional change into account in order to facilitate social integration with ICT, based on all the experience gained since the pilot study in the school of Villa Cardal up to the present. In addition, the use of ICT should not follow a rigid curriculum plan, but should develop in each educational community. Teacher training has the support not only of the National Public Education Administration (ANEP), but also of the Network of Volunteers in Support of Plan CEIBAL (RAP in Spanish), the University of the Republic and organisations of Free Software users. Organised in a cascade format, in-service teacher training should focus on inter- and transdisciplinary methods, including areas such as validation and analysis of the information available on the Internet, knowledge of how to implement projects, and a decrease in communication barriers between teachers and students.

Graciela Rabajoli, Julia Pieruzzi Tirelli, Roberto Elissalde and Karina Acosta share their experience regarding the Community Telecentres Network (RUTELCO), whose objective is to promote universal access to information. The network has 200 telecentres throughout the country and its members are ANTEL, the Ministry of Education and Culture centres (MEC Centres) and the Committee for Democracy in Information Technology (CDI). Each centre includes XO computers (used by Plan CEIBAL) in order to help parents to understand this technology better and keep up with development towards a knowledge society. CDI, in cooperation with Citizenship and Computing Schools (ECI) and community radios, empowers access to knowledge for persons with limited resources. The use of technological tools is learned within the framework of projects in the areas of ecology, health or human rights. This educational methodology is based on Seymour Papert’s constructivist school of learning and on Paulo Freire’s social proposals. The 100 MEC Centres support communities with fewer than 5000 inhabitants, offering digital literacy workshops with proprietary and free software, and specific courses on the use of XOs for adults. In addition, MEC Centres operate as social promoters, whose
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main objective is the critical and creative use of ICT, together with the organisation of cultural activities, such as culture factories or reading incentivation days.

Roberto Balaguer Prestes analyses the attraction of video games for young people. The advanced graphic design of video games leads to immersion and a high level of identification with their characters, which can result in the construction of a second, parallel, life. Video games offer training in challenging decision-making situations. They constitute a way of using a cultural area which is different to those of their parents, who are often illiterate when it comes to the world of digital games. While dependence on them represents a real danger, it is also true that video games – particularly those that promote group interaction – can contribute to self-esteem, based on the recognition of virtual achievements by the group. With regard to their educational use of the different levels of motivation used when playing can serve as a model for a learning spiral in a modern educational environment.

Fernando da Rosa Morena describes how to navigate the Internet safely and responsibly. Children, parents and teachers should be aware of the risks of surfing the Internet; a simple search or an innocent word can lead to sites depicting violent content, child pornography, racism, drug abuse, etc. School servers make use of content filters in order to prevent children from obtaining access to inappropriate information. Nonetheless, content filters are not infallible and besides, we should remember that out of school, children can connect to the Internet through networks which lack such filters. For this reason, children should be aware of certain criteria in order to evaluate the sites they use. As the Internet makes anonymous contact easy, children should know that they must never give strangers their personal information, or that of their parents, and that they should never meet in person someone they have met on the Internet, without first telling their parents. Trust between children and parents is therefore very important when children are confronted with improper or insulting images or content during their surfing. Both parents and children should be aware of the swindles that take place on the Internet. For example, false banks or inexistent lottery agencies, whose purpose is to obtain personal data such as bank account or credit card numbers, in order to make an inappropriate use of that information.

María del Carmen Scavone Farina, María Dolores Izquierdo Mañorqui, Marta Peñalva and Ana María Fernández Pereira deal with the effects of Plan CEIBAL on education in special schools in Uruguay, for students with intellectual and physical disabilities (visual, hearing and motor disabilities). Working with the Plan CEIBAL computers stimulates the
motivation of teachers, students and parents, who form a triangle of key beneficiaries of the programme. Children with special needs should receive the same or better opportunities to access information and knowledge than others. In the context of Plan CEIBAL, it has been possible to strengthen digital literacy and include a blog on the work of students in workshops, with the purpose of making social interaction and labour competencies more flexible. For students with hearing disabilities, Plan CEIBAL fosters social and family participation in aspects of bilingualism. A digital dictionary of Uruguayan sign language which includes videotapes from all the regions in Uruguay encourages the acquisition of reading and writing skills. In order to improve these students’ capacity to write, chat sessions are recommended in special schools, as well as electronic games. The picture dictionary which helps to explain unknown concepts has been another hit. Schools for students with motor disabilities show to what extent Plan CEIBAL laptops motivate children, help them increase their self-esteem and understand their own difficulties better, as well as reduce hyperactivity and inattention.

Martín Pérez Burger refers to the evaluation dimension with regard to the educational and social impact of Plan CEIBAL. Very often, this impact is measured through the reduction of the digital divide which indicates the social, economic and cultural distance existing between those who have and those who lack access to ICT, its appropriate use to communicate and to seek and produce information. In this context, the change in the daily lives of students both inside and outside the school environment brought about by the use of ICTs represents a key indicator for
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the evaluation of impact. Studies show that the impact of ICT in education goes hand-in-hand with a broader construction of cultural change. Before the launch of Plan CEIBAL, only 6% of schools had access to ICTs in computer labs. In just two years, this situation has changed dramatically. ANEP and LATU are responsible for the continuous evaluation of Plan CEIBAL, including an analysis of connectivity on the basis of the permanent monitoring of school servers.

José Barrios shows forms of participation which include children and their families. In weekly workshops with parents and children, teachers encourage trust on the part of parents, as well as a better understanding of the work carried out with the XOs. Thanks to this participation opportunity, parents learn to use XOs in order to help their children with their homework. The CEIBAL television channel will provide an additional tool to make the voice of teachers, parents and children heard throughout the country. In only three years, the implementation of Plan CEIBAL has dramatically transformed how children communicate. Today, they communicate independently with journalists, writers and friends in other countries. Children’s communication through chat rooms, blogs and video films will expand to the whole of society, promoting social transformation towards a knowledge society. With open and creative curriculum plans, platforms for distance education, portals and fora, it will be possible to replace the classroom monoculture by an ecology of knowledge which will reshape school life and its links with the community.

The Appendices provide information on the content of Plan CEIBAL with regard to electronic government, food, nutrition, health and protection from dengue fever. In Appendix 1 there is an overview of the growing number of public services in Uruguay offering information and interaction with the population through the Internet.

In Appendix 2, the Food and Agriculture Organization of the United Nations (FAO) introduces informative material for training and awareness-raising with regard to improving food and nutrition, through the development of home gardens and farms. This is a contribution to the implementation of the Millennium Development Goals (MDGs) for 2015. Projects involving horticultural, fruit and organic production and farm animal breeding in FAO’s “TELFOOD” campaign serve as an example for the community to implement similar projects. The Pan American Health Organization also explains the right to food, according to the Declaration of the Millennium Development Goals. The purpose of the guide to healthy eating, which contains information regarding the right way to include the different food groups, as well as other healthy eating habits, is to guide and help people to live responsibly. In addition,
PAHO provides a report on measures to be applied in Uruguay in order to prevent the reproduction of the Aedes aegypti mosquito, which transmits dengue fever (a disease for which there is no vaccine) and yellow fever. It should be borne in mind that climate change contributes to the proliferation of these mosquitoes.

Finally, Appendix 3 describes part of the work proposal related to the expansion of Plan CEIBAL in Middle School, in keeping with the general and specific objectives of Plan CEIBAL for Uruguay.

**Günther Cyranek**

Doctor in Computer Engineering from Bremen University, Germany. Licentiate degree in Computer Science from the University of Karlsruhe, Germany. Master's degree in Pedagogy and Psychology from Justus Liebig University of Giessen, Germany. He was UNESCO Adviser in Communication and Computers for Sub-Saharan Africa, in Addis Ababa, Ethiopia (1998-2004). At present he is Adviser for Communication and Information for MERCOSUR countries (Argentina, Brazil, Paraguay, Uruguay) and Chile. Information and Communication Sector.
CHAPTER 1

Plan CEIBAL
Brief description and principal policies
Introduction

“All of us in Uruguay should not only be equal in the eyes of the Law, which is important, but also equal in life.”

(Presidency of the Republic, 2006)

Plan CEibal (Educational Connectivity in Basic Computing for Online Learning) was implemented in Uruguay within the framework of the Access to Digital Information Equity Plan, pursuant to Presidential Decree Nº 144/007 of 18 April 2007.

The project originated in the non-profit association OLPC (“One Laptop per Child”) and was adopted by our country in a specific format which makes it unique in the world. Uruguayan professionals drafted the educational project for the first pilot experience. It included all children and teachers in the Uruguayan state school system, throughout the country.

Thus, Uruguay became a worldwide reference point with regard to the inclusion of technology in primary education. This is now being extended to middle school.
The implementation of the Plan was carried out by means of an interinstitutional project, which initially involved the Presidency of the Republic, the Technological Laboratory of Uruguay (LATU, for its acronym in Spanish), the National Public Education Administration (ANEP), the Central Directing Council (CODICEN), the Primary Education Council (CEP), the Ministry of Education and Culture (MEC), the Agency for the Development of Electronic Government and the Information and Knowledge Society (AGESIC), the National Research and Innovation Agency (ANII) and the National Telecommunications Administration (ANTEL).

CEIBAL distributed free laptops with wireless connection between each other and to the Internet, both for students and for teachers, with the purpose of making access to IT and to the Internet universal within a period of two years. This meant coverage of approximately 2300 schools in Regular and Special Primary Education, with 350,000 students and 18,000 teachers.

The project is based on three essential elements: an educational component, manifested through an Education Project published in September 2007, which is non-prescriptive and sufficiently broad to enable the development of innovative projects in education centres or in the classroom; a social component, which focuses on equity, within the context of social inclusion; and a technological component, providing widespread access to laptops and the Internet.

«The strategic principles encompassed by this project include equity, equal opportunities for all children and teenagers, the democratization of knowledge, of the availability of learning tools and of a learning which does not only entail the education provided at schools, but also self-learning through the use of modern technology themselves.» (Presidency of the Republic, 2006)

In an effort to reduce the digital divide existing in the country, a laptop and connectivity to the Internet were provided free of charge to all the
target groups encompassed by the Plan. This means offering equal opportunities, the democratisation of knowledge and the promotion of new forms of literacy. In order to achieve the effective integration of children and young people into the information and knowledge society, they should all have equal opportunities, not only as regards access to information and communications but also to new learning environments, in keeping with the technological context of modern society. To this end, the active participation of students, teachers, families and the community is encouraged, not only to promote access to technology, but to broaden learning and develop awareness of the need and importance of ongoing education. The aim is to improve the quality of education by integrating technology into the classroom, the school and the family, aiming at: «The development of a cooperative culture in four directions: child-child, child-teacher, teacher-teacher and child-family-school.» (Plan CEIBAL, 2007) In addition, the plan promotes the use of technology as a support for the teaching plans of teachers and schools. In order to achieve this, the goal is to provide continuous training and updates for teachers, in the field of both technology and education, thus fostering the rational use of available resources. In a further strategy, the CEIBAL Portal provides a variety of educational contents using these technologies. This process is framed within a proposal for the appropriation of innovation by teachers and the whole of the education system. To this end, support and technological
and educational assistance systems are generated in order to achieve more highly developed educational experiences, fostering teacher and school autonomy. In this way, genuine learning communities will emerge in a variety of settings: general, which includes the whole body of teachers, unique to each school; and in specific interinstitutional groups generated by common interests.

**Laptop characteristics**
The equipment used so far consists of low-cost XO computers, designed to be used in the classroom. They therefore consume little power, are protected against water and dust, and are light and easy to carry. The dual screen (black and white, and colour) enables them to be used both in enclosed spaces and in the open without any difficulty, even in direct sunlight. They include a wireless interface for connection to the Internet, as well as to a “mesh” network; thus, the computers are connected without the mediation of specific antennas and each XO serves as a bridge, providing connectivity to the Internet to another which lacks direct access to an antenna. They have an anti-burglary device with automatic blocking. Data can be stored on a removable SD card; there are three USB ports and an integrated video camera. The operating system used is Linux, with a Sugar interface. In this respect, it is worth noting that the interface makes use of child-friendly metaphors, similar to play rooms and games rather than to the metaphor of a desktop and folders, which is extensively used, but is foreign to the features typical of children’s activities. Other formats are under review for the implementation of the Plan in middle school. At present, nearly 200 activities can be downloaded, most of them developed specifically for XOs. They are classified in eleven categories and some of them are downloaded more than 4000 times a week.
Deployment stages
Plan CEIBAL has been deployed in several stages.
1. The pilot test in the Escuela Italia, in Villa Cardal, Florida, began on 10 May 2007. One hundred and sixty computers were distributed to all the children and teachers and the school and its surrounding areas were provided with connectivity. The laptop version was also experimental and was replaced by an improved version at the end of the year.
2. Coverage for the whole department of Florida was achieved in late 2007.
3. Deployment throughout the departments of the interior of the country, with the exception of Canelones, was carried out in 2008. In addition, pilot experiences were set up that year in eight schools within the metropolitan area.
4. Distribution to all of the remaining education centres, with 100% coverage. The last laptop was delivered on 15 October 2009.
5. In compliance with a decree of

15 December 2008, the Plan was broadened to include middle and private schools. In addition to the natural incorporation which occurred in 2009, when all of the students entering middle school in the interior of the country brought their XOs with them, pilot plans were implemented in Treinta y Tres and in Flores, with different desktop interfaces.

New methods of education
From an educational point of view, it is understood that it is not enough to provide each student with a computer;
this only democratises access. For the Plan to become a route to genuine equity, democratisation should also be present in how the equipment is used. The use of these devices therefore implies a methodological change, and the establishment of a 1:1 model (one student, one computer). Thus the child can engage in permanent interaction with his/her device and, motivated by personal interests, actively develop knowledge building, modifying the traditional formats of the educational process. Children learn by doing, and as they continue to use their laptops outside the school setting, teaching is extended in time and space. The 1:1 model promotes interaction and cooperation between students. The production of original knowledge is encouraged and the model of a student who consumes information develops into the model of a student who is capable of analysing information obtained critically and of using it as an input for his or her own production. In this respect, it is worth noting the number of spaces on the Internet created, maintained and updated by the children themselves, in which the particular features of each context are also borne in mind.

Giving children laptops and letting them take them home, radically modifies the closed classroom format. The fact that they are seen using their XOs outside the school, in parks, on the bus and elsewhere is evidence of this change. Students continue using their devices outside their schools, and, in addition, share them with other members of their household. This means that not only the children have access to this technology, but their families, can make use of it as well, either to help them with their school work or to receive training themselves. Homes which lacked computers and/or a connection to the Internet have gained access to a broad range of possibilities benefiting the whole family, often leading to improvements with regard to work, culture, information or training.

The Plan’s Education Project was carried out on the basis of the first experiences, in the understanding that a foreign and

Thus the child can engage in permanent interaction with his/her device and, motivated by personal interests, actively develop knowledge building, modifying the traditional formats of the educational process.
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A decontextualised strategy could not be accepted. Thus, the Education Project was designed in September 2007, once the pilot experience was under way (Plan CEIBAL, 2007), and contains the general guidelines for implementation in primary school. The project for middle school was produced in consultation with specialists in this field during the course of 2009; bearing in mind the various experiences carried out during the first years in the schools in the interior of the country (see Work Proposal in Appendix 3).

**Training**

At first, training was carried out in a “cascade” format, training directors, inspectors and technology teachers so that they could pass on their knowledge to classroom teachers. This method did not always lead to satisfactory results, as it meant overloading people’s specific duties. In this respect, in addition to
providing opportunities for direct training of teachers in optional courses or in workshops held with the support of the networks of volunteers, the aim was to create the concept of the teacher as a motivator. In 2009, the concept of the CEIBAL teacher reached out to over 400 teachers in Montevideo and Canelones. They received extensive training so that each teacher in the system could turn to a colleague with whom they shared space and time at school for advice and support. The first experiences focused mainly on using the equipment and the resources included in the laptops. Using these tools intelligently during routine class work is a major challenge and this kind of personal support aims at the following objective: to facilitate the educational appropriation of the laptops in order to apply them to class work, as well as to support the possibilities this new educational proposal provides.

**The CEIBAL Portal**

www.ceibal.edu.uy is Plan CEIBAL’s socio-educational portal. Its purpose is to constitute a basic support tool in the construction of learning and the dissemination of significant information to the whole community. The work of the CEIBAL Portal focuses on children and teenagers as well as on teachers and families. It permanently seeks to become:

- A gateway to hundreds of learning objects, and to other educational resources, current and contextualised. These resources aim to support the customisation of education in order to facilitate the levelling of learning, exercise and/or practice, to respect different learning and working styles both within and without the classroom, to promote autonomy with a view to an informal and ongoing education, and to facilitate competencies for the 21st century with regard to searching for and selecting information on the network.

- A motivating tool for the inclusion of ICT in the classroom. Learning objects and other resources enable teachers to innovate, using these tools to stimulate, practise and evaluate. There are also a number of different ways of providing updates for teachers, from online workshops on the CEIBAL Campus, to academic articles in their field of interest.

- A bridge to promote the participation of all the members of the community in cooperative learning networks. A variety of projects are continuously offered to the members of the community, seeking their participation in different settings, inviting them to become an active part of CEIBAL.

- A reference site for anyone who seeks to learn about the Plan in depth, providing all the necessary information regarding its origins and its expansion stages, its pedagogical proposal, relevant decrees, etc.
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Evaluation
Plan CEIBAL is evaluated on the basis of two components: social impact and educational impact. In this respect, it should be borne in mind that in activities of this kind, evaluation always focuses on a specific stage of implementation of the Plan. For the last 25 years, ICTs have been incorporated into our country’s educational process. Education systems have adopted them gradually, by means of different somewhat widespread initiatives, and at a slow pace, even though the technological context has changed extremely rapidly. In an initiative such as that proposed by Plan CEIBAL, in which technology enters everyday classroom practice, the periods taken to keep in step with changes in technology are necessarily long. For this reason, evaluation should be considered a snapshot of a specific moment, and they should be viewed as such when making projections for the future.

Conclusion
Within the framework of the Equity Plan, Plan CEIBAL provides equal access to information through the deployment of laptops and connectivity, as well as equity because, in addition to guaranteeing access, it develops a strong educational component which seems to evolve more slowly but also modifies the school format, focusing on methodological changes, adapting education to current times. Furthermore, the scope of this reaches far beyond the school setting. The Plan delivers the laptops to the children as owners, which means that they take them home and their families also have access to them. In places where access to technological tools is reduced or non-existent, this promotes equality regarding access to the environment… Numerous testimonies indicate that there have been changes in the links between families and schools. Connections have been strengthened, not only through obtaining access to digital communication in households where it did not previously exist, but because of the need for parents to learn about these new tools, in order to support their children, who now assume a leading role and teach the older generations.
Within the framework of the Equity Plan, Plan CEIBAL provides equal access to information through the deployment of laptops and connectivity, as well as equity because, in addition to guaranteeing access, it develops a strong educational component which... modifies the school format, focusing on methodological changes, adapting education to current times.

The modifications to the school format go beyond the use of XOs at school. Opportunities for teacher updates have positioned educators within the real situation of “learning to learn” and lifelong training. The classroom is no longer limited to the space behind the door, but generates many opportunities for encounters; not only “official” ones, but through support networks, the constant search for online courses, etc. Genuine learning communities have emerged, with a reassessment of the teacher’s role, adapting it to the style of education in the century in which we now live.

New figures have also appeared as role-models in schools, assisting teachers in their work with regard not only to the instrumental handling of the laptops, but also in their search for educational applications. In this way, on the basis of technology, new approaches emerge, more from within the classroom itself than from definitions arising outside it, which make it possible to generate a great educational transformation.

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CHAPTER 2
CHAPTER 2

The school renewal process
Introduction
The purpose of this article is to consider the common ground between two programmes developed in the course of the last five years: the Community Teachers Programme (*Programa de Maestros Comunitarios*) and the Plan CEIBAL. These two programmes, with apparently significant differences in objectives, are framed within an area which is seldom taken into account when designing education policies: the homes which school children come from.

This is not a mere coincidence. The fact that the Community Teachers Programme and Plan CEIBAL include the family as a significant actor in their children’s education implies thinking of an “open school” where teaching responsibility is shared with other stakeholders.

Moreover, this represents an education policy model, where the term “school” is not only used to describe what lies within the walls of the building with classrooms, but also includes a new
way of understanding its relationship with its context. In this regard, we understand that the school interacts with its context through a variety of school management modalities that determine different types of relationships that somehow redefine the concepts of “inside” and “outside” the institution. The relationship between the school and students’ families leads us to an analysis that will help identify how teachers in an institution incorporate (or fail to incorporate) the following factors into their teaching styles: knowledge of the community, the way families raise their children, their needs, the way they understand and get to know the world. Students have adult role models who always relate to the school, regardless of whether or not they participate in school management. This association with the school is not solely a parent-school relationship; in fact, it always involves their children. In this sense, the Community Teachers Programme and the Plan CEIBAL include families as relevant actors in bringing together the three basic dimensions that secure the transmission of culture: schools, communities and families.

1. On the Community Teachers Programme
Community teachers began operating in August 2005 as part of a project involving over three hundred and fifty state schools nationwide. Amongst its many objectives, this programme aims at improving the relationship between families and schools by providing specific pedagogical support to children and their families. The Community Teachers Programme is based on a number of assumptions. For children to be successful in school, it is necessary to organise adult support using a common language. The community teacher is an institutional representative, who facilitates the use of a common language related to child-raising, teaching and knowledge, so that parents, families, communities and schools can strengthen their mutual
understanding. The community teacher is a teacher who visits the neighbourhood to support school work with families. In all cases, this participation aims at providing children with more quality teaching time, and attempting to personalise the work modality. The job is carried out by teachers, preferably teachers from the same school, who work different shifts and in coordination with the institution's teaching staff, so that their strategies converge with the teachers' activities in the classroom. Thus we can say that the Community Teachers Programme provides more school time, though in different settings, and all of the students in the school are entitled to it, though not all of them will need it at the same time.

There are many ways of being a community teacher, however, there are some guidelines that summarise the work that is carried out. These courses of action are divided into two areas of intervention: home and school. Their objective is to support both families and students. In some instances, the community teacher have a family member as a direct interlocutor and the activities take place within the school premises (groups with families); at other times, working with the family takes place at home together with an adult role model (home literacy). There are times when the student is the focus point and the aim is to integrate him/her into the group (learning for integration). On other occasions, the aim is to help children advance more than one grade in one year, so that they can be with their age peers acceleration.

How community teachers implement their pedagogical task depends on the needs of children, their families and their schools. All of these actions are strategies aimed at the same goal, which can be achieved in different ways: by supporting the adult role models so they can accompany their children more appropriately to do the tasks assigned by the school. Accordingly, the aim of the teacher's intervention is to help the family recover confidence in their own possibilities. To this end, the

The Community Teachers Programme is based on a number of assumptions. For children to be successful in school, it is necessary to organise adult support using a common language.
community teacher shows the adult in charge of supporting the child the way (the “how”) and the reasons (the “why”) for working with certain content in the classroom. When this activity is done at home, it is always in his/her presence. Yet this activity with adults is not aimed at educating the families. It is always in connection with the children, in an atmosphere of trust, and is meant to enhance their individual capacity. Adults are expected to recognise their educational role as individuals who know and can teach, while children are expected to recognize adults as mirrors reflecting their own possibilities.

The other area for community teachers’ intervention with families is the school. In this case, the proposal suggests working with groups of families and during these meetings the integration of different educational agents – as learning intermediaries – is fostered. On these occasions they deal with topics related to childhood as a personal development period and with the need to recover the educational potential of daily-life situations. The groups of parents who get together propose the most varied objectives, ranging from recovering a neighbourhood memory to teaching traditional games to their children, including cooking homemade jam or publishing a community newspaper. Simultaneously, the community teacher tries to address school issues and other issues related to the participation of the adult role model as indispensable cultural intermediaries in the child’s learning process.
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2. Plan CEIBAL and Community Teachers Programme: two policies that foster a new partnership with families

Plan CEIBAL has significant points of contact with the Community Teachers Programme and this has to do, undoubtedly, with expanding pedagogical time and the incorporation of families into the educational processes. This common ground was present from the very beginning of CEIBAL to such an extent that in many schools the key actor for the success of this plan was the community teacher. Both strategies converged in the school setting and also at home. Plan CEIBAL, based on the delivery of one laptop per child, does not mean the mere incorporation of digital literacy, which in itself is extremely relevant, it also constitutes an opportunity to extend school time and improve its quality. This is achieved by providing all public school students with an IT tool that is also highly valued by their families. This means facilitating access of all state school children across the country to “new technologies” so that they can use this new tool not just in school but also at home, with their own families. Likewise, we cannot limit the community teacher’s actions to working with the families. The programme sets out to extend children’s pedagogical time and to go beyond the school walls. A teacher who works a second shift with families at home is a teacher who is helping to increase the time devoted to teaching and is also placing that school time at home.

Given this framework, we must point out that the Community Teachers Programme and Plan CEIBAL have both recognized the need to come up with new modalities in the school-family relationship, resulting in consequences as relevant for the school as those previously mentioned in connection with families. Both the Community Teachers Programme and Plan CEIBAL have a direct impact on family life; yet a rebound effect is also felt by the schools, leading to an opportunity for
Both the Community Teachers Programme and Plan CEIBAL have a direct impact on family life; yet a rebound effect is also felt by the schools, leading to an opportunity for them to reconsider the limits of their own boundaries. XO laptop go to the student’s home. Just as school work allows for new relationships between teachers and families within the Community Teachers Programme, XO laptops provide an opportunity to connect schools and homes in new and different ways. Teaching time is extended and incorporates new actors; not just the students, but their parents and siblings, thus providing “school time” for all. This has allowed families to recover their trust in schools and their projects; schools in turn reinforce their commitment to achieving complementarity in their efforts with families.

them to reconsider the limits of their own boundaries. If a teacher provides support for work in homes, is this teacher working “inside” or “outside” the school? If a laptop allows a child to communicate with other students in different schools, is it “inside” or “outside” the school?

The job of community teachers as well as the delivery of XO laptops implies a new contract with families based on the certainty that families must not be perceived as the cause of learning difficulties in children but rather as an opportunity to enhance such learning. This entails a change of focus on the role of families vis-à-vis the education of their children. It is for this reason that both the community teacher and the
3. XO: a two-way bridge

The incorporation of XO laptops in schools has had a considerable impact. This can be seen in the testimonials of community teachers that convey a different image of the school landscape, which now also features parents eager to learn. This is not just about the traditional concern families express in relation to their children’s performance at school. Now, it is parents who attend school-coordinated workshops because they want to know more so that they can support their sons and daughters, but also because they want to learn more themselves. Teachers are responding to this enthusiasm through one of the instruments developed by community teachers: groups with families. This is a new stimulant that brings people together and, at the same time, facilitates coordination between the work of the teacher in school and the help to families at home. As they make their way into households, XO laptops become a new...
Parents are beginning to realise that opportunity is not limited by a family’s economic possibilities. They perceive that a principle of social justice is being enacted through this policy as conditions are established to ensure that all children have equal access to information and communication.

4. Laptops from the family perspective
From the very beginning, families expressed mixed feelings caused by their “not knowing how to use a computer”. This lack of knowledge generated some hesitation: the tools they had used when learning – such as pencils and notebooks – were to be replaced by others that were completely alien to them. This reinforced the feeling of being unable to accompany the learning process of their children.

The appropriate intervention of the school is now helping families perceive laptops as a new resource to teach what is already known. Yet the activities being planned to address these situations in the school seem to leave behind the concept of school dynamics where the teacher is responsible for a group of children. In the steps taken to incorporate laptops in schools, a new modality of work is emerging where teachers are involved with other stakeholders: the technical experts who support this experience and the community agents who are making their resources available.

At this point, we should like to quote the voices of families who also feel this impact in a significant way. According to a mother whose words were recorded by a community teacher: «Teacher, this is like a dream. I thought we would never have a computer and now we have four. I look at them and think how wonderful it is for all children to have one, regardless of whether their parents are able to buy them. Last night, it was already eleven thirty, and I couldn’t move them away from their laptops, seeing that many other classmates were still connected [...] I feel all children receive equal treatment and they can obtain information and learn...
and this does not represent a cost for the family. I tell my children that they have to value this opportunity and really take good care of the machine. We are all very happy, our lives have changed, I spend hours looking at my children, so enthusiastic with their machines.» Parents are beginning to realise that opportunity is not limited by a family’s economic possibilities. They perceive that a principle of social justice is being enacted through this policy as conditions are established to ensure that all children have equal access to information and communication. This sense of justice is so strong that it will have a direct impact on the trust families place in schools and in the possibilities of this democratising project. Equality is also being translated into these programmes; the fact that families perceive this and community teachers deliver to all alike, makes equality more than just empty discourse.

5. The “inside” and the “outside” aspects of school seen from another perspective
As mentioned above, the impact of these programmes also reaches the school as an institution which, in turn, starts changing its own self-vision. To rethink the role of adults in their relation with the school, simultaneously implies new ways of relating with the “outside” of the school and also implies a reorganisation of the “inside”. Incorporating parents into this digital literacy process for new generations gave them the opportunity to voice their uncertainties and learn. The school provides that instance and, to do so, receives the support of other professionals. This effort started by the community teacher with groups of families motivated teachers to plan shared strategies to respond to a demand that families probably did not express in a very articulate manner, but which was, nevertheless, met. In addition, the support of other technical experts and community organisations was a key to explaining why this proposal was so well accepted. This approach, moreover, reinforces
a trend in the way schools operate, something the Community Teachers Programme had already set in motion. Therefore, it would not be an exaggeration to say that both programmes have had an impact on the daily activities of institutions, and after five years of implementing the Community Teachers Programme and two years of CEIBAL, we are in a position to confirm that they have both fostered a “new modality in the delivery of education”.

On the basis of the Community Teachers Programme and the Plan CEIBAL, the school has a possibility to “connect” with families in an innovative way. According to a community teacher, “because the antenna is in the school we see the picture of whole families around the laptops between 12 noon and 1 o’clock. Parents are closer to their children and they all interconnect.» These emerging changes also have their equivalent at the level of the institution. What appears in this picture is that the school environment is changing, yet this “outside” impact suggests similar profound changes “inside” as well. Children are the leading actors in this plan and they are playing their roles while learning. “They explore”, “they help one another and, repeatedly, they teach us”. The school is being renewed.

**AUTHORS’ NOTE:** A similar version of this article ("Dos herramientas de política educativa: Maestros Comunitarios y Plan CEIBAL"), by the same authors, was published in RABAJOLI, Graciela; IBARRA, Mario; BÁEZ, Mónica (comps.) (2009): Las Tecnologías de la Información y la Comunicación en el Aula. Plan CEIBAL-MEC-Uruguay. Montevideo: Una ONU/MEC/Dirección de Educación.
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CHAPTER 3
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The CEIBAL model
New spaces for educational interaction and communication
Introduction
The aim of this chapter is to analyse the impact and implications of promoting the educational inclusion of laptops through an innovative method, which implies that individuals and technology should be absolutely equivalent. This is the 1:1 model; one child, one laptop.

The use of technology with educational purposes necessarily implies that teachers and students must make changes in the way they work. New ways of thinking emerge, in keeping with the empowerment that digital devices are capable of providing; new ways of doing and of being, but also a different way of interacting and communicating in educational terms. The boundaries of learning spaces become blurred, and face-to-face and online activities coexist in a continuum between the “inside” and the “outside” of the school.

How can we access information in these new settings? How does educational communication take place? Where do inter-relations take place?
Does educational mediation in the new 100% technological scenarios facilitate learning? Is it necessary to change the methodologies? Will this lead to changes in education and, therefore, in society? These are only some of the questions we must now ask ourselves in the face of the challenge of consolidating the 1:1 model to which the country committed in 2007 in the belief that we were embarking upon an experience from which there would be no return.

**Closing the gaps**
The possibility of obtaining simultaneous worldwide access to information, goods, services, contacts, etc. is changing the space-time dimensions in which we used to operate, within the different spheres of our activities. Thanks to the introduction of information and communication technology (ICT), labour, educational, recreational or human relations environments are empowering high-impact processes of individual and collective development. Together with these processes, significant inclusion/exclusion phenomena, resulting from unequal access to these technologies are emerging, leading to further inequality. According to M. Castells (1999): «Access to information, education and technology is one of the key factors which marks the great social differences existing in the world. […] And as information capacity is concentrated in very specific social sectors and countries, education inequality has become social exclusion.»

In brief, the impact of ICT in society affects different groups unequally, harming the more vulnerable sectors in particular, and giving rise to the phenomenon known as the “digital divide”. One of the factors many authors regard as key to overcoming the wide gaps which are the outcome of the increasingly widespread use of ICTs in all areas of our lives and the globalisation associated with this process is what has come to be known as “curriculum integration”.
However, many of these authors state that the digital divide is just another aspect of the social gap. It has become ever more important to provide not only access to technology but to its appropriation as well; that is, to the rational use of technology. To a large extent, this translates into great differences in how the various social groups develop and, of course, we cannot lose sight of the fact that the availability of digital content and services can inhibit or encourage such development. In this context, we should ask ourselves how education systems and society as a whole react in the face of these phenomena, and what role they should play in order to bridge the digital gap and why not the social gap.

In response to these concerns, the Uruguayan State made a commitment to equity and decided to implement a strategy to promote the assertive use of ICT. This strategy included a genuinely revolutionary initiative which, just over two years ago, became Plan CEIBAL.

A challenge to education
With this historical background, education faces a number of challenges, amongst which is that of integrating ICTs in order to encourage the development of the necessary capabilities so that students can acquire the knowledge and skills which will be useful in the 21st century. So far, face-to-face methodologies have proven to be the best pedagogical device when attempting to achieve the school attendance of the whole of the population. The different demands modern society imposes upon education, as well as the introduction of technology – a distinctive feature of contemporary life – make it highly
probable that profound changes may take place in how schooling will be in the future. Although the use of small and easy-to-handle mobile technological devices for educational purposes had already spread throughout the world as from the early nineties (by means of experiences such as those sponsored by Apple and Microsoft in schools in the USA and Canada), it was only after the initiative presented by Nicholas Negroponte and promoted by OLPC that these experiences began to be valued and implemented extensively. Plan CEIBAL was not only one of the first experiences to adopt the OLPC model, but, in addition, Uruguay was the first country in the world to complete a deployment of these characteristics on a nationwide scale. However, even more challenging than the technological model CEIBAL proposes; that is, the 1:1 model, is the challenge arising in the field of methodology, in the design of activities, in the possibilities it offers for individual and collective learning pace, in the allocation of roles and the different interactions possible between individuals, as well as between individuals and technology, made possible by the technology available now in every classroom in the country. When these mobile devices are used in face-to-face teaching, they expand the classroom beyond the physical walls of the school and therefore make it possible to emancipate the act of education from the traditional educational units of space, time and action and, consequently, maximise opportunities for teaching and learning.

This model also generates rationales for coming into contact with information, which entail the assertive mediation of the technology available. This gives rise to a new kind of subjectivity in the subjects of education, which enables them to process both the learning function and the teaching function in a different way.

At the same time, a new virtual space-time emerges in the 1:1 modality, with its own possibilities and limitations, which must be properly addressed on the basis of our own teaching and learning model: the CEIBAL model.
The information and knowledge society

The information society points to a new specific form of social organisation in which the generation, processing and transmission of information become essential sources of productivity and power, owing to the new technological conditions which are emerging in this new historical period (in M. Castells, 1998). According to the line of thinking suggested by Castells, it is possible to infer that information is a set of meaningful and relevant data which describe events or entities. On the other hand, knowledge is an output; it is the outcome of processing the information we obtain by means of the senses, of connecting it to prior knowledge to produce structures which enable us to understand, interpret and, eventually, become aware of everything that surrounds us and even of ourselves. That is, knowledge resides within us and is the outcome of our mental processes, whereas information comes from outside. However, both of these concepts are not infrequently confused, and thus references are made indiscriminately to the information society and to the knowledge society, as if they were synonymous.

It is, therefore, worth taking a moment to recall that the idea of an “information society” was introduced by Bell in 1973 (I. Torres Hernández, 2007), when he highlighted the role of knowledge in post-industrial society. This first reference to the term referred to a paradigm related to the profound changes which took place as from the start of the new millennium. This transformation occurs as a result of the new media available at present to create and disseminate information: the digital media. At the same time, the concept of a “knowledge society” arose towards the end of the nineties and is used mainly in academic circles, encompassing a more comprehensive conception of today’s society.

«While the notion of an information society is related to the idea of technological innovation, the concept of a knowledge society includes an element of social, cultural, economic, political and institutional transformation, as well as a more pluralistic and open perspective.» (I. Torres Hernández, 2007)
At present, and as a result of the phenomena mentioned above, we are witnessing a process in which the relationships established by learners amongst themselves, and their own relationships with information, knowledge and the different technologies available are being, to a large extent, redefined.

Individuals receiving education: immigrants, natives and settlers

At present, and as a result of the generation gap still persist in the context of education, particularly in formal education. At times, the imbalance of power in teacher-learner relationships is still believed to be legitimate, based solely on the existence of specific roles, which are understood to be fixed and pre-established, without any possibility of movement or interchange. Yet the situation which is becoming increasingly frequent to see in classrooms is that persons receiving education establish links with the knowledge and technology at their disposal in very different ways. There is, in addition, a growing number of authors who, precisely because of these different forms of establishing these relationships, describe individuals as “digital natives, immigrants or settlers”, depending on how they perceive reality, process information, prioritize the usefulness and validity of information, determine the strategies they implement in order to transform it into knowledge, etc.

The notion that the transmission
of information is bidirectional is thus gaining ground at present. This kind of transmission demands intergenerational interaction and interactivity, with children learning from their elders, and they are also given the opportunity to teach not only their peers, but adults as well, as they are considered to be in possession of valuable knowledge, especially in the area of technological skill.

In educational and social terms, one of the most significant technological capabilities is known as “appropriation”. For a number of years, Marc Prensky has been devoting a large part of his work to describing individuals as digital natives or immigrants, depending not only on their capacity for technological appropriation, but on their time of birth and, consequently, to how long they have been exposed to the technological stimuli present in today’s society.

More recently, Alejandro Piscitelli (2009) included a further dimension,
which emphasises people’s attitude towards technology rather than how long they have been exposed to it, and thus adding a further category: digital settlers. Antonio M. Battro, a doctor in Psychology at the University of Paris, and Head of Education of the OLPC Foundation, states that each generation has a completely different language and, in addition, perceives information in different ways. Parents do not understand their children’s pace because they are not used to the immediacy which now surrounds the digital lives of children (in A. M. Battro; P. J. Denham, 2007).

These qualities and the attitude of individuals towards knowledge and technology have given rise to profound transformations, from which the web has not been excluded. In it, as in other settings, changes are not guided by new technologies which continue to appear, but by the attitudes of the users towards them; by a fundamental change in their mentality, which encourages individuals to take part in the development of new structures and content in the digital age.

### Summary chart

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<tr>
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<th>Born in the digital era</th>
<th>Born before the digital era</th>
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<td>Uses the technologies available</td>
<td>NATIVE</td>
<td>SETTLER</td>
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<tr>
<td>Does not use the technologies available</td>
<td>EXCLUDED</td>
<td>IMMIGRANT</td>
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Virtual space-time: the extended school

The CEIBAL Model proposes the inclusion of technology in the classroom in a 1:1 format, in which laptops and connectivity are provided in ownership, free of charge, to both children and teachers. This makes it possible to use this technology not only within, but also outside the physical school area, which leads to the challenges involved in what is known as the “extended school”, a term which we too adopt.

The concept of an extended school implies the consideration of a variety of scenarios, in which the functions of teaching and learning can be processed. These can be represented in a continuum between face-to-face and distance formats, and by two focal points for the planning of educational actions (E. Barbera; A. Badia, 2005), inside and outside the confines of a classroom. Thus, the classic educational units of time, place and action are transformed and
opportunities for teaching and learning are maximised as both functions are strengthened, gaining in accessibility, individualisation and possibilities for collaborative learning; also promoting the dissemination of information in multiple formats. In this new context, students do not learn only within the physical setting of a school; the school itself extends its temporal and spatial boundaries. Research is carried out in depth in order to broaden knowledge and improve capabilities and skills, according to the needs and interests of the learners. In this mode of use, the adoption of a learning strategy which will accompany learners throughout their formative careers is promoted. Strategies for learning how to learn thus acquire lifelong relevance. The role of the teacher is fundamental when selecting and using digital educational resources, independently of their intrinsic benefits. Therefore, it is essential to train teachers as well as students in how to manage successfully the overwhelming amounts of information which can be accessed through the technology available today. Addressing the search, evaluation, organisation and use of input emerging from extremely varied and content-rich sources demands the development of capabilities in individuals, which are related to the appropriate handling of information. This idea leads to what Pierre Lévy (2004) defines as “collective intelligence”,...
The role of the teacher is fundamental when selecting and using digital educational resources, independently of their intrinsic benefits. Therefore, it is essential to train teachers as well as students in how to manage successfully the overwhelming amounts of information which can be accessed through the technology available today.

which, he says, is «...a form of universally distributed intelligence, constantly enhanced, coordinated in real time, and resulting in the effective mobilisation of skills. I will add the following indispensable characteristic to this definition: The basis and goal of collective intelligence is the mutual perception and enrichment of individuals rather than the cult of fetishized or hypostatised communities.»
Yet while collective intelligence is presented as a real possibility, the opportunities for widespread access to virtually unlimited volumes of information multiply exponentially, allowing learning (even academic learning) to take place outside the school as well. Within this context, one cannot, however, refrain from defending the role of the school as the best place in which to coordinate and contextualise content.
According to Pierre Lévy (2004): «We develop skills through our interaction with objects. Through our connection with signs and information, we acquire knowledge. Through our relationship to others, mediated by processes of initiation and transmission, we bring knowledge to life.»

Collaborative learning in the new learning space
The current historical moment constitutes a perfect opportunity to rethink education in the 21st century, as there is a need to review the role of peer groups and social networks in the learning process, and to consider how to turn them assertively to the advantage of teaching.
With the technology available today, new media and ways of establishing relationships are emerging. For the last 20 years, Howard Rheingold, a Stanford University professor, has been one of the leading thinkers in digital culture. He is the writer and thinker who introduced the “Smart Mobs” concept. Rheingold (2005) refers to an emerging collaborative world, marked by the omnipresence of participatory means of communication and by collective action. Yet this increase in collaboration is not the consequence of the emergence of these new media; on the contrary, their existence responds to our gregarious nature, to our natural human instinct to work in groups. Towards the middle of the 20th century, learning theories prioritized individual knowledge rather than social knowledge. However, by the end of the century, the socio-cultural approach placed a high value on the
social aspect as a complement to each individual’s personal cognitive process. One of the reasons for the rapid advance of newer technologies such as the worldwide web, and collaborative and participatory tools such as videoconferences and blogs, is that it has been possible to integrate them smoothly with the teaching methods of conventional classrooms. Each student arrives at school with a different knowledge base, a range of capabilities and skills and a variety of abilities and goals. For this reason, it is necessary to organise school activities around a wide array of educational strategies, in which ICTs now play an essential role.

When referring to collaborative learning, we must not lose sight of the two pillars on which extended schooling is based: educational flexibility, which broadens when provided with access opportunities for every student, so that they can develop their potential to the utmost, and the customisation of learning, which in this framework implies bearing in mind, in school and beyond it, the needs and individual characteristics of learners. Collaborative learning was born in response to a new socio-cultural context, which strongly conditions “how” we learn (socially, with others) and “where” we learn (in a network and on The Network). In this context, the Web operates as the new assembly place of the 21st century (L. M. Zaañartu Correa, NDA).

The process of collaborative-cooperative learning promotes the development of individual and group skills and possesses four distinctive features: it takes place in a group, it does not depend on a specific place, it is not restricted to a specific time (as it is an asynchronous event), and it is usually mediated. These four features are closely linked to the basic elements of online group work: interaction, positive interdependence, individual contributions to the work of all, and both personal and group skills. According to Vygotsky, learning is a way to adapt our mental structures in keeping with our experiences,
in order to interpret and continue to relate to our surroundings. Here we should make a stop to reflect upon the concept of the zone of proximal development: in a group of people there are coincident proximal zones which have a potential for development, for learning, made possible through inter-relationships. Although some authors tend to link the concept of collaborative learning to the notion of cooperative learning, there are others who establish a distinction: although both are based on a constructivist vision of learning, collaborative learning is based on socio-constructivism, whereas cooperative learning leans more towards the views propounded by Piaget. If we review these concepts from the CEIBAL standpoint, and think about them from the perspective of who designs the route to be followed in an educational process, in collaborative learning it is the group itself that does this; that is, the control point belongs to
the group. On the other hand, in cooperative learning, it is the teacher who determines the steps to be taken by the group, who structures the route to be followed, the moments for interaction and the outcomes to be obtained. In both cases, teachers are part of the process, but the roles they assume in one case or the other are very different.

Thanks to the arrival of participatory media to the network, media which are within everyone's reach, we all now have the chance to create – as well as to consume. In this sense, we have all become prosumers. This is why it is becoming more and more necessary to promote the construction of intelligent communities in which our cognitive and social potential can be mutually developed and enhanced.

Another of the characteristics of virtual environments is that information and the communication processes are technologically mediated by computers and networks. This feature provides a very clear specificity in terms of the educational integration of technology, since new learning environments which change the traditional roles of individuals are generated, making ICT not only a teaching resource, but also a tool for communication, and a medium with which to influence educational and social change within the community in which the school is established.
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References
The origins and challenges of an inclusion strategy: Plan CEIBAL
Introduction
Plan CEIBAL is a socio-educational plan that enables the integration and coordination of ICTs within the school curriculum, from where they extend to the family and community. The idea is that each state school boy, girl and teacher should receive a laptop that has been created specifically for educational purposes. Yet this plan is not simply to provide equipment and access; it also guarantees the ownership of the digital medium and places it in context. The objective is to offer equal opportunities to all citizens, by promoting the democratisation of knowledge and the inclusion of technology to reduce the existing digital divide. Accordingly, it was necessary to investigate the background of different experiences based on the 1:1 modality; establish the type of training to be provided to teachers and analyse the numerous factors that could condition the process, with the aim of achieving the efficient inclusion of technology in the school environment.
In this chapter we reflect upon the challenges that Uruguayan education is now facing, how this initiative was originated, its objectives and strategic action lines, as well as the different activities taking place at present.

1. The origins

«The strategic principles encompassed by this project are equity, equal opportunities for all children and teenagers, democratisation of knowledge, of the availability of learning tools and of a learning which does not only entail the education provided at school, but also self-learning regarding how to use modern technology.» With these words, Dr Tabaré Vázquez, President of Uruguay, officially announced this initiative on December 2006 during the launching of the Equity Programme for Access to Digital Information (PEAID in Spanish). Based on the original idea generated at MIT (Massachusetts Institute of Technology) in 2005, Nicholas Negroponte created a non-profit organisation called OLPC1, with headquarters in Delaware (USA), for the design, manufacture and distribution of these laptops. The low cost of these units would allow them to reach out to a large number of users, and in this way access on a large scale was assured.

The initial approach2 was for the units to be sold to governments and delivered to students under the “one laptop per child” principle. Due to its size and population, Uruguay was not considered for one of the first experiences. However, the chance of a donation of 200 computers came up, and it determined the inception of Plan CEIBAL (Spanish acronym for “Educational Connectivity in Basic Computing for Online Learning”). The Technological Laboratory of Uruguay (LATU) was then entrusted...
with the technical and operational implementation while an inter-institutional committee composed by ANEP (CODICEN); CEP, MEC, AGESIC; ANII, ANTEL and LATU was entrusted with the objective of agreeing the conditions, timelines and contents, in order to carry out the Plan with the following objective «... to ensure that by 2009 all state school students and teachers nationwide will have received a laptop.»

The first Uruguayan experience within the framework of Plan CEIBAL was launched in May 2007, in a primary school of about 150 students in Villa Cardal, a small village of 1300 inhabitants located in the department of Florida, 100 km north of Montevideo. Subsequently, the Plan continued to expand and by 2008 it covered 17 of the 19 departments. It reached its ultimate goal in 2009, when every boy and girl in the country was included in the Plan.
2. Background

Neither technology nor learning is the core of this analysis, but they are both variables to be taken into account when looking at the final results of ICT-related programmes, in terms of their social impact. The international proposals on ICT professional development for teachers that were studied did not adapt to the necessary activities and strategies required by our teachers, given the characteristics of the Plan. The following somehow summarises what other relevant world experiences had concluded in relation to the 1:1 modality implemented in the USA, Canada, Colombia and Costa Rica, and to the steps being taken in teacher training in different Latin-American countries, when Plan CEIBAL began. All of these experiences have been compiled and studied, including the evaluation of programmes such as the one developed in Canada, created by McCullough more than five years ago, and currently led by Ron Canuel, called “Enhanced Learning Strategy”; those from the state of Maine and the County of Henrico in the USA, where implementation has been sustained for a longer period. They all suggest that this 1:1 modality is worth taking into account (A. Zucker, 2005).

In the Latin-American context, a substantial contribution comes from the “Proyecto Conexiones” (Connections Project) in Colombia. The focus is on the processes and interactions taking place in learning environments. The experience of El Silencio School in Costa Rica, similar to the Uruguayan 1:1 modality caused us to pay special attention to the conclusions reached by the researchers of the Omar Dengo Foundation. Their assessment of the social impact and equity conditions of the programmes that introduce ICTs in learning environments has been positive. They consider that technology is yet another variable to be taken into account; they understand the importance of conceptualising the relationship between ICTs and society as a “dialectic interaction” and they have tried to study the effects and social impact that technology generates in specific contexts and populations.

Neither technology nor learning is the core of this analysis, but they are both variables to be taken into account when looking at the final results of ICT-related programmes, in terms of their social impact.
They also suggest a type of analysis to guide not only the methodology development process but also its application. In our country, and bearing recent studies in mind, we should consider the opinions expressed in 2006 at the Education Debate Congress with reference to ICTs. From this proposal stems a tacit and unquestionable approval of ICT use in education, as measures taken to be at different levels are suggested.

It must be recalled that as from 1986 greater attention has been paid to the incorporation of technologies in education, both in primary and secondary school. Computer rooms were created with approximately 14 terminals and a server in each. These new tools favoured the emergence of renovated learning environments that supported teachers’ activities during classes. Some of these modernised rooms still exist today. Another proposal that was considered as a precedent was “One PC per Classroom”. Programmes submitted by IBM for some kindergartens were also taken into consideration. As regards ICT-training for teachers, national experiences and international proposals were studied. The conclusion was that they did not adjust to the activities and strategies required by our teachers, given the characteristics of the Plan. This is the reason why specific training was organised for the first experience in Cardal; it was evaluated and adapted throughout the process, in order to meet needs that had not been previously contemplated.

3. Courses of action

On 24 June 2008, Councillor Hector Florit of CODICEN stated: «the country has strong technical teams, solid inter-institutional collaboration, professional teacher development, and a Uruguayan school that is able to incorporate technology without abandoning its own identity.»

The global strategy of the Plan consists
of different courses of action that maintain a systematic relationship. From the beginning, all actions were directed at comprehensive solutions: training and assistance for teachers, technical and pedagogical support, infrastructure for connectivity, software maintenance and hardware development, creation and dissemination of educational digital resources, promotion of innovative initiatives, exchange of experiences, evaluative inquiry on the practice and impact on the community, among others. Specific adjustments to the different lines emerged during the process.

3.1. Comprehensive use of computers for educational purposes as the means to support school and classroom pedagogical proposals

3.1.1. Different areas of usage are established. Their choice depends on the timely decision made by the teacher as to which strategy to implement, taking into account the interests and needs of the students, the special features of the corresponding curriculum, the specific project guidelines of the school, etc.

3.1.2. It should be emphasised that computers are viewed as being important elements for learning. They are considered a medium to serve learning, student learning processes and social construction of knowledge.

3.1.3. The use of computers allows several courses to be followed in planning actions in education:
- The way the medium is used in networking, in the network and/or interacting with software (collaborative learning and/or customised education);
- The place where education takes place (in or outside the classroom);
- The use of the technological device during the development of the educational action (functions, objectives to be achieved, etc.)

We know that these considerations determine the characteristics of all of the activities to be planned (E. Barbera; A. Badia, 2005).

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In 2007 the “Pedagogical Project” document was produced as a theoretical and conceptual framework providing guidelines for actions in education.

3.2. Appropriation of innovation by teachers

3.2.1. Teacher training and in-service updating on the educational use of these means and the creation of innovative experiences.

One of the issues causing most concern when integrating technology into classrooms – once technology has been appropriated by teachers who learn
how to use it – is how to incorporate this technology into the curriculum. Several phases were considered (J. H. Sánchez, 2002). The geographical distribution of the 19 departments of Uruguay and the infrastructure of the system (inspections by department, technology centres, etc.) allowed the proposal to be planned according to a cascade implementation method, with a strategy addressing the existing institutional team and regional facilitators, who would play the role of multipliers, conveying the strategies to classroom teachers and providing the necessary support. We should point out that all of our teachers have received systematic training, so we are talking about in-service professional development in the use of this technology. On the other hand, although not all of the teachers were trained in the use of technology, schools included different models of technology, such as computer rooms with a full-time
...all of our teachers have received systematic training, so we are talking about in-service professional development in the use of this technology.

Computer skills teacher in nearly all regular schools and full-time schools, and some of them included a PC in the classroom. Three lines of contents were established for all phases. Activities were adjusted while interacting with the different groups in each department, always following these three lines, and in accordance with the process evaluation. The fixed contents are: technical aspects, theoretical framework of the 1:1 modality, team work, surfing, and working with families. The mobile contents include issues such as pedagogical and educational experiences of the different regions through the input of several teachers known for their background and experience in the use of XO laptops.

3.2.2. Building support systems and specific technical and pedagogical assistance aimed at school experiences, to ensure their adequate development. The Plan has received the invaluable collaboration of RAP CEIBAL volunteers and the Extension Area of the School of Social Science, (Science of Communication) of the University of the Republic of Uruguay, who organised several different events for exchange and support in the use of XO technology.

3.2.3. The creation of communication spaces, exchange of experiences, cooperation and collaboration between the different levels involved (inspectors, supporting teachers, classroom teachers, technicians) was fostered. An example of this was the “Regional Forum on Educational Contents and Digital Intelligence” held in Montevideo on 23, 24 and 25 June 2008, which was broadcast live over the network. It was an opportunity for analysis and reflection on the way technology is used. Distinguished Uruguayan and foreign experts participated, and workshops were held for one month on the virtual CEIBAL campus. Public school teachers from all over the country were able to participate. Regarding the presentation of experiences related to the Plan in other events, we must mention the exchange of experiences in the use of computers in the classroom during the meeting on “Health Education”; the “Internet and Reading” conference of the Ministry of Education and Culture at the National Book Fair; fairs held in different departments on the subject of successful experiences (November 15 to 20, 2008), and the National...
Fair held at LATU, in December 2008, amongst others. We must also consider the seminars for teachers organised by volunteers, mainly for face-to-face and distance technical training in the use of XO laptops.

3.3. Parent involvement in the support and promotion of the use of technology in a rational, appropriate and responsible way, for the benefit of the child and the family

The involvement of parents and the community in the project is essential in this aspect. Briefing meetings are held before the XOs are delivered. This entails the scheduling of activities in order to strengthen the bonds between school and community. The proposal calls for close work with families, sharing responsibilities such as looking after the equipment and knowing what steps to follow in the case of damage, and supervision in the use of chatrooms and other websites.

3.4. Production and dissemination of education content according to the technical requirements of the XOs and the promotion of spaces in which different stakeholders can share and interact

www.ceibal.edu.uy is the website for the Education Portal of Plan CEIBAL. Created to disseminate educational resources and to gather experiences and material, the Education Portal is a place where teachers’ input becomes increasingly relevant. Virtual exchange areas are also being promoted. With a view to contributing to the enhancement and preservation of our national identity and culture, it is essential to create and disseminate our own contents.

As to the Content Area, educational resources have been designed and developed (learning objects, treasure hunts, WebQuest). The idea is to consider and support classroom activities in terms of customised learning, information search on the network and team learning, particularly taking into account the curriculum content as well as currently relevant social issues.
With a view to contributing to the enhancement and preservation of our national identity and culture, it is essential to create and disseminate our own contents.

Many public and private institutions offer their support, documents, contents, videos, images, etc. in order to create resources. The portal also includes a “blogosphere”, which is now being catalogued in order to incorporate blogs that are currently scattered all over the network.

3.5. Indispensable support systems and technical assistance. This involves maintenance and the necessary and possible updates to ensure the best performance of the equipment and software and issues relative to connectivity. The execution stage of the project required a structure to run it; a technical team and a logistics team. Several countries have made the mistake of leaving the responsibility for this in the hands of the education system itself. In our case, LATU is in charge and calls for public bids in order to address issues involving laptops, connectivity equipment, servers, antennas, transmission equipment and the satellite signal. Before the computers were delivered, a cartographic survey was carried out, using the geographical references of all the schools. This information was made available in order to facilitate the installation of the wiring connecting each school building. ANTEL (the national telecommunications utility) is responsible for this procedure. LATU is in charge of installing servers in every school. Computer traceability enables monitoring the laptops. International bids were called for the purchase of equipment, and the computers’ operating system was accurately identified. Pedagogical requirements were also considered. The final decision was based on price.

3.6. Evaluative inquiry on project development with the participation of all parties involved, in order to produce relevant information for decision-making and to improve performance. A research team is in charge of follow-up and investigation for the project. In 2008, a Work Plan was drafted, geared to the first phase of the evaluation, with the main objective of producing valid and reliable information on the implementation, the results and the impact of the Plan on the school population, at family level and in the community in general. The purpose is to know how children are managing and what their skills and attitudes are with regard to collaborative work and networking; all analysed in accordance with the social and cultural context, as well as their initial skills. On a social level specifically, the idea is to observe any changes in opportunities, behaviour, knowledge,
possibilities, perceptions and well-being of family and community participants to whom the Plan is targeted, and identify the items that contribute or represent an obstacle, emphasising social equity.

In terms of education, the idea is to produce information that fits the institutional framework. The educational evaluation aims at accompanying the technology incorporation process – the school is pivotal in this transformation – by building on the collective awareness of the institutional stakeholders involved, as to what is being assessed and why.

In general terms, the idea is to produce a baseline with indicators that allow for future follow-up of the Plan’s impact at cultural, social, educational, financial, political and democratic levels. Finally, the target is to identify innovative experiences and good practices associated with implementation. The ultimate goal of this ongoing assessment is to acquire knowledge of the Plan and provide useful information that will contribute to its success as well as to an increase of its positive impact on people.

The evaluation of the Education Portal is also included, as regards validation of the resources available, the community’s use of resources and the spaces offered by the portal, and the interactivity that it generates.

The method proposed for the first phase of this assessment combines quantitative and qualitative strategies and involves both primary and secondary information sources.

3.7. Coordination of actions with the different stakeholders

The RAP CEIBAL volunteers’ network, so far comprising 1000 people, supports the experience nationwide. They offer face-to-face and distance courses on the use of computers to other volunteers and teachers.

An agreement was reached with the Community Telecentres Network (RUTELCO)9 for each of its telecentres to train its staff to provide support for
both children and community in the use of computers and provide a space and specific activities for this purpose. To do so, telecentres have a Wi-Fi connection and some of the Plan’s XO laptops. Several exchange activities have been held with private schools that have expressed an interest in incorporating this technology in their own classrooms. Teachers from several ANEP sub-systems have been granted the opportunity of buying commercial laptops. Different models are being offered and in all cases, the system grants a loan and a bonus per computer, in order to promote purchase.

Undoubtedly, the incorporation of these devices has caused changes in student behaviour, as regards motivation and the increase in school attendance. We also see more interest on the part of parents in relation to their children’s school work, and an improved or enhanced relationship between family members. Technology fosters interaction because spaces move out of the classroom; this implies an inside and an outside of school and there is more flexibility in terms of timetables. The screen becomes a stage and has started to displace other media such as television. Several meetings with different Latin-American representatives have taken

4. Final Considerations

The rapid growth of Information and Communication Technologies, the lower cost of digital devices (mobile phones, PDAs, Tablet PCs, laptops) and network access have favoured a new education modality, the so-called m-learning or mobile learning. Children and teenagers are skilled at handling technology and this is what is making this method possible. Yet mobile learning has different meanings depending on context. Learning can take place via portable technology; thus, the key lies in the method used. Attention can be focused on the learner’s mobility and, ultimately, the focus of attention is society and its institutions, enabling and supporting a society that is becoming increasingly mobile. Undoubtedly, the incorporation of these devices has caused changes in student behaviour, as regards motivation and spaces move out of the classroom; this implies an inside and an outside of school and there is more flexibility in terms of timetables. The screen becomes a stage and has started to displace other media such as television. Several meetings with different Latin-American representatives have taken
place. Solidarity bonds with other countries have become stronger and many professionals have shown their interest in the progress of this Plan. This is mainly due to its complete coverage: by 2009, the Plan will have covered all public school children in the country, with the additional bonus that the computer belongs to the child who can then take it home.

In addition to the educational potential of bringing technology into the classroom, the CEIBAL model represents a social impact that strengthens school-community ties. The Ministers of Education, meeting in El Salvador on 19 May 2008, adopted a commitment in their final declaration to support the “Educational Goals for 2021: The Education We Want for the Bicentennial Generation”.

This can have great repercussions in Ibero-American education, as the goal for the next decade is for education to adequately meet social demands that can no longer be postponed, given that education is considered the fundamental strategy to advance social cohesion and inclusion.

Analysing the information and proposals relative to ICTs and education, one of the goals seeks to achieve a laptop-student ratio of about 1-8 and 1-40 by 2015; 1-1 and 1-10 by 2021; by 2021, teachers and students should be using computers regularly in the teaching-learning process. Today, at the close of 2009, Uruguay is about to accomplish the first stage of achievement.

CEIBAL continues making headway. The meaningful use of technology should begin with a meaningful construction by the teachers. Teachers must take up the challenge and acknowledge the opportunity to further develop their professional roles.

The screen includes other media and breaks away from the linear organisation of the print culture. It calls for participation, valuing networking as an opportunity to access, manage, integrate, assess and create information that can be turned into knowledge; it suggests a methodological change to learn by doing, learn by interacting, learn by searching and learn by sharing. This will open up a new perspective in education and a change of perspective in the community as CEIBAL is one of the most substantial challenges facing Uruguayan education today.
OLPC is based on constructionist learning theories initially developed by Seymour Papert and later followed by Alan Kay, as well as on the principles presented in Being Digital by Nicholas Negroponte.

Information and analytical documents on previous experiences, online: www.iadb.org/sds/SCI/site_7245_s.htm


Online: www.etsb.qc.ca

Online: www.edutopia.org/maine-event

Online: www.communit.es/node/33560/307

Omar Dengo Foundation Report. Online: www.fod.ac.cr

Montevideo was the venue for “CEIBAL Aprende”, “Regional Forum on Educational Content and Digital Intelligence” (23, 24 & 25 June 2008), on the exchange of experiences relative to education portals, digital resources and the incorporation of ICTs in classrooms.

The MEC Centres together with CASI (Centres for Information Society Access) and CIS (Social Internet Centres), the Uruguay Information Society Network, fostered by ANTEL (national telecommunications utility). Together with the CDI (Computing Democratization Committee) they constitute RUTELCO. These are all actions geared to reduce the digital divide by facilitating the access of the less privileged members of society to Information and Communication Technologies (ICTs).

Mobility has been possible thanks to scientific breakthroughs. It has developed and affects all aspects of life, forcing individuals to constantly change their frameworks of reference. We live in a mobile society where changes in experience and knowledge are permanent. (in José Ignacio Ruiz Olabuénaga, 2007).
XO computers in every state school
A challenge to the task of teaching
Introduction
Plan CEibal’s XO computers have now been delivered to primary school teachers and students in all the state schools in the country. They constitute a valuable resource which has been added to the possibilities offered by the school in its specific task: to provide education. It necessary to reflect, individually and collectively, on how to make this happen. Those of us who have been teaching for many years also acknowledge the value of other technologies which we brought into our schools and classrooms in the past. Some of the most highly-valued were 16mm film projectors, audio cassette players, slide projectors, television and video and DVD players. On every occasion, whenever a new technology emerged, we learned that technology in itself did not necessarily resolve the complex task of teaching, and that we needed to be alert in order to ensure that these devices were integrated with a specific educational purpose, to prevent wasting our limited teaching time.
These lessons are useful warnings with regard to the need to reflect upon this new resource. This is not just one more resource which the teacher brings to the classroom and decides when to use. Everyone has access to it, and for a length of time which exceeds the school timetable. It belongs to teachers and children; they can explore it on their own or with others, within and without the school. Previously, it was the teachers, and a few of the children, who knew how to handle a film projector; it was a single piece of equipment, it was very expensive and demanded knowing how to thread films through with care. It was also we teachers who made the decision of when to use the slide projector, or any other piece of equipment. Today, children have far more time than teachers to explore the possibilities of computers. They know how to “download” music and send e-mails; they have time to exchange ideas with friends and family members, who always have some new piece of information to contribute, which they then share with their friends. They were born in an era of electronic devices and are not afraid to press a key. Adults are more fearful; we wait for someone to teach us how to do it, whenever we have time. This resource goes beyond being a mere tool with which to learn subject-matter content; research studies are analysing the modifications it generates in cognitive processes, which in turn lead to new forms of thinking and acting. We teachers, who chose this profession that entails teaching our students to learn, are now immersed in this technological world ourselves. The responsibility is ours; we are the professional educators and the decision regarding what we are going to teach and how, is ours; without forgetting why we are doing this, and with what purpose. This is not the children’s task. We have often heard it said that the children know more about the XOs than the teachers. Yes, it is very likely that they do know more than most of us about a number of
operations the computer is capable of carrying out. But not about their educational use; that is specifically our task as teachers. The responsibility of didactic transposition cannot be transferred. It is through decisions made about how to manage teaching activities that the general working conditions are structured: how the class is organised (individual, group whole class tasks, etc.), where the work will take place and with what resources, how long it will take, and other decisions related to the teaching content. The level at which these tasks take place, the knowledge the children have and other factors will define these didactic variables and, in particular, the choice of assignments; the setting of problems which will contribute to the construction of knowledge, which is the object of teaching.

When resources are selected, it is important to consider computers as specific tools which offer enormous and varied opportunities, but with which
one must necessarily be familiar in order to optimise their use in keeping with the teaching content. We must avoid the risk of computers at school becoming time-fillers which fail to contribute to progress in learning. They should not be used as entertainment, or to mete out rewards or punishment; they are valuable resources to be used for teaching and learning.

The purpose of this article is to contribute to reflections on the relevance of using XOs in activities without losing sight of the task objective, and using all the possibilities these resources offer. Children are in school for a very short time, if compared to the length of time they spend out of school. A child who goes to school every day, for four hours a day, is in school one twelfth (1/12) of the year¹. This makes it necessary to optimize teaching time by incorporating projects with a clear educational purpose in order to promote learning. We have frequently carried out “nice” activities, which motivated children, but which lacked a clear educational purpose or were so wide-ranging that their objective became blurred. At their conclusion, when reflecting upon what such activities contributed to the children, we may have felt disappointed. Planning the work day is not merely a pedagogical issue; it is also an ethical matter. All children have the right to quality education and it is our responsibility as teachers to guarantee it.

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Schools connected to the Internet can access valuable sources of information which can enhance the development of knowledge in a variety of fields (Social Science, Nature, the Arts, etc.). E-mail exchanges with other children and adults from different places lead to learning about other ways of life, other cultures, the existence of different productive activities, and so on. When planning activities, it is necessary to establish precisely the purpose of the search for information. Information in itself does not ensure that students will acquire knowledge. In addition, the selection of information makes it necessary to analyse the criteria that
validate the source and its content. The use of the Internet calls for a clear rationale to guide the search for information. Children must know why they are connecting to the Internet, what information they are seeking and what they are going to do with it (read, select what is useful, copy, include it in a paper, organise it into a semantic chart, etc.). Some examples of activities will be presented for analysis in this chapter. In every case, the teaching objective will be stated and a description will be provided of how an XO can be a relevant resource in order to achieve this objective.

We shall study some possibilities of use without an Internet connection, bearing in mind mainly rural schools in which Internet access is not yet possible, for whatever reason, or in which connection is difficult. Even without an Internet connection, XO computers provide many opportunities for use, giving children a justifiable reason to take them to class every day, together with their other material.

The teaching of writing skills, from early education to 6th grade, is the responsibility of the school. To this end, teachers must be aware of what their students know and what they should learn, according to their needs and to the content established by the curriculum.

The issue here is not the extent or complexity of the content to be taught, but the clarity of purpose. For this reason, some of the examples shown may seem simple, but the point is to insist upon the search for relevance between the content to be taught and the activity chosen.

Some of the content to be taught during the 1st year of primary school is the use of capital letters. Children will not attain this knowledge if they only print their letters using capitals. The activities teachers propose should vary, in keeping with the children’s circumstances. In a first year class, perhaps one of these activities could consist of writing an invitation to someone to attend a show the class has planned. The children can plan it and dictate it to the teacher so that he/she can write it up on the blackboard in large letters, clearly legible to all. The teacher writes the text out in capital letters, so that the children can then decide when to use capitals and when to use lower case letters. Decisions such as where to place a full stop and why, when to start writing on a new line, even though there is still space on the line being written on, can be made collectively.
The oral instructions given to the children are: “Write the invitation on your computers. Work in pairs (two children per laptop), and use capitals and small letters where necessary.” The keyboard, which shows the letters in capitals, poses no difficulties for the children to determine the right key to press. They do, however, need to make decisions about when to press the “Shift” key. The use of capital letters at the beginning of a sentence and how to write proper names constitute knowledge that children in the 1st year must develop. This activity allows them to reflect, together with their peers, on how to use this knowledge.

The teacher should move from group to group, intervening in order to generate opportunities for reflection. Children will need to deploy different kinds of knowledge in order to carry out this activity, but they should not be confused as to the “use of capital letters” content, which is the objective of this endeavour. This activity will enable them to reaffirm other knowledge which is also brought into play: that there should be a space between the words, which can be achieved by pressing the “space bar” on the computer only once; that when we use a full stop, we often begin a new line, and this means that on the XO we need to press the “Enter” key, and so on. Not all of the children may have yet discovered the relationship between all of the capitals and small letters, and this activity does not demand that they do so, as the keyboard only shows capital letters. However, in order to check whether the right key was pressed, children can, in the first place, count the number of letters to see whether they have the same number the teacher wrote. If there are repetitions, they can press a key again, to see whether the small letter on the screen corresponds to the capital letter on the keyboard. They can erase
letters without tearing their pages; their work will look neat and legible, without any motor function limitations coming into play.
The children who wrote the text shown in the second picture omitted some of the letters, but showed an excellent command of the use of capital letters, a task which required them to think. Any mistakes can be corrected when the work is shared, when the letters of each word are counted and the words are read paying attention to all of their phonemes, so that the children can identify the graphemes on their screens. Errors can be corrected by counting the number of letters, by analysing whether letters are repeated or not, as well as which letters are repeated and where. Nothing ensures that whoever wrote the text knows how to read. He/she may have achieved an excellent correspondence task which could also have been achieved had the graphemes not been letters. Collective and repeated reading of the text prior to writing on the XOs is indispensable in order to give meaning to the work and provide reassurance; thus strengthening the children’s confidence and promoting their ability to learn. Only if the children understand what they read will they be able to select capital letters when required.
Pair work organisation is a didactic variable which should be controlled by the teacher in order to enhance exchange and the knowledge of each member of the pair. The appearance of proper names in the middle of sentences can be a further didactic variable controlled by the teacher in order to reaffirm the objective of the activity (teaching the use of capital letters). Writing the text on the blackboard during the sharing stage, using capital and lower case letters, and also in large print visible to all, with the children exercising control, will make it possible to analyse the content of the teaching object and enable each pair to make corrections without having to rewrite the whole text.
The computer should be a resource used every day for the teaching of writing at all levels, with activities planned in keeping with the achievements wished to be promoted. “Scratch” is another resource available on the XOs to work with stories and other texts, in which character animation can be introduced. A warning is necessary, however: the use of the laptop should not distract from the language objective being pursued. This resource makes rewriting text, which children find tedious when using pencil and paper, easier to accomplish. Words move aside to make room for the adjective
being added; paragraphs change place to make the text coherent, without the need to erase and make holes in the pages. The problem of not having coloured pencils is over. Everyone can draw and colour in the scenarios and characters. Expression work provides a valuable opportunity here. Saving activities in the “Journal” makes it possible for children to return to them whenever necessary in order to improve them, replace some terms with synonyms, introduce punctuation, add connectors, etc. Here are some examples of the possibilities available in some of the XO programmes, for teaching mathematics.

The XO calculator has great potential: the right half of the computer screen shows a record of all the operations carried out; attentive observation here is valuable in developing learning. For example, if the objective in 1st year is to teach “n + 10” calculation repertoires, the children could be asked to choose a variety of numbers, and to each add the number 10, working in pairs with the XO calculator. Once they have carried out these operations, they could be asked to observe the transformations numbers experience when 10 is added to them. This activity reinforces the fact that tens increase by 1s. The teacher could suggest that they anticipate, through mental calculation, what the sum of any given number + 10 would be. In other classes, the regularities to be studied could be different. Thus, in 3rd and 4th years, when children are working with rational numbers, they could find new meaning in multiplication. Children in 2nd year associate multiplication with abbreviated addition and believe that this operation always “increases”. If the rubric were to state: “Using the XO calculator, find out what happens to a number when it is multiplied by 0, by 1 and by 0.5”, children could input different multiplications and become
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aware of the transformations numbers experience.
Thus, they could discover the absorbing property when multiplying by 0, and the neutral property when multiplying by 1. When they multiply the number \( n \) by 0.5, they will discover that the result is equal to \( n:2 \). Sharing these discoveries will lead to opportunities to make generalisations allowing students to develop these calculating tools. The TortugArte programme offers excellent opportunities for Geometry work. The example shows different regular polygons constructed by children, using some of their knowledge regarding regular polygons: their congruent sides and angles.

Many different subject areas could be exercised with this application: drawing parallel lines, perpendicular lines, parallelograms, angles, etc. Problems could be incorporated which provide an opportunity to bring a range of knowledge into play. For example, when the turtle depicts a circumference, it only draws a line, without identifying the centre. The problem could be: “How can you make the turtle draw three different circumferences using the same point as the centre?”

From the educational point of view, ICTs constitute an advantage for collaborative learning processes, inasmuch as they:
- promote interpersonal communication, which is one of the basic pillars of online learning, since it facilitates the exchange of information, dialogue and discussion between all of the people involved in the process;
- facilitate collaborative work by allowing learners to share information, work jointly on papers and make problem-solving and decision-making easier.

All activities should enhance interaction
as a learning opportunity, and not only in teacher-students, student-student interaction; classroom walls open wide in the face of the new technologies and in this new space, families and other actors in the task of education should also be incorporated.

New scenarios are created which call for a review of routines and reflection on practices; this is consistent with the professionalism of teaching practice.

1 4 class hours by 180 days; total per year: 720 hours, equivalent to 30 days (24 x 30 = 720 hours).
CHAPTER 6

Education portals and digital resources
Introduction
This article develops the concept of education media from the beginning of modern education to current digital resources in learning, and then goes into a detailed account of education portals as pivotal resources. In addition, it provides an in-depth analysis of collaborative learning and learning networks as the major strength of portals.
Digital resources in learning: past and present

«Innovative teaching requires better materials from both a technical and an educational point of view.»
Julio Cabero (2001)

Almost from the very beginning of formal education there have been different materials that were considered educational and used by teachers to support their teaching practice and learning processes. Information and communication media and technologies are much more than simple physical supports that transmit information; much more than channels allowing communication between a transmitter and a receptor. M. Area (2004:75) suggests that they «also help structure learning processes and activities», in line with other authors who consider that information and communication media and technologies «have the potential to shape thought and its representations; that is, they act as tools in the social construction of culture.» To think of these media as mere devices that transmit content is akin to conceiving education and learning as the «transmission of information by the teacher and the medium and, in consequence, the reception of information by the students.»

Learning resources and ICT
All digital educational material must comprise at least three characteristics in order to meet the required educational objectives and make a sound and rational use of the possibilities provided by IT support.

1. Hypertextuality: hypertext is in itself a fundamentally innovative contribution to the teaching and learning process. The hypertext system, like the hypermedia system, has substantially modified traditional
ways of reading and writing. That is the greatest innovation provided by hypertext: reading is no longer linear and sequential, instead, different blocks of information relate through continuous associations. Associative links are, in the long run, far richer “hyperlinks”, producing in the reader the feeling of instant access to new information. In this way, the creation of texts enriched with links acting as mediators/facilitators of learning is fostered, insofar as these links represent significant relations their own links. Thus, readers actively modify the text and can even personalise it; readers evolve from being consumers to being active collaborators in the construction and reconstruction of the text, recreating it according to a non-linear, individual structure, and adding their own concepts and knowledge.

2. A multimedia structure: simultaneously integrates different information formats: textual, graphic, audio and iconic (M. Area, 2004:96); thus, «the reader reacts to overlapping stimuli (colours, form, sound…) that are present in formal structures that he himself selects (…) The screen becomes a perception area where different types of elements appear that basically respond to visual codes that imply a type of learning and the enhancement of the user’s communication competence.» By integrating different codes, the understanding and learning capacity of a person is enhanced, as different

Interactive environments grant students some degree of control over their own learning process, which becomes more autonomous and self-regulated...

for learning, as they awaken prior knowledge in each individual and this allows the person to understand the meaning of new concepts. The new technologies bring into this process the capacity to define those “leaps forward” in reading as “links” or with the different parts of the text. On the basis of the author’s proposal, the reader can choose relations and assign them an order of importance that may or may not coincide with the author’s intention. Furthermore, in some systems, readers can create
learning modalities and strategies are included. Given these two characteristics we can now talk about a hypermedia format that is a combination of a multimedia system with a hypertextual structure, an indispensable requirement to tap into digital educational materials.

3. Interactivity: Communication with other subjects must be favoured and a higher level of interactivity between the student’s action and the equipment’s response must be incorporated by providing a variety of activities for the student to carry out. This characteristic is essential to foster relevant learning as, according to the constructivist theories inspired by Vygotsky, knowledge is built through social interaction. In the case of digital educational materials, this interaction also refers to the possibility – unheard of in the case of other educational media – of the receptor modifying in his response the initial message of the transmitter. Interactive environments grant students some degree of control over their own learning process, which becomes more autonomous and self-regulated (M. Area; A. García-Valcárcel, 2001:416; M. Area, 2004:102).

In the field of digital educational material, we find two presentation formats (M. Area 2004:95-106): CD-ROM or web-based distribution. Though both share the above-mentioned characteristics, they need to be differentiated.

Digital educational material presented in a CD-ROM format is, in a way, a published product, as several copies can be obtained from a single matrix – just like a printed book. It can be transported and disseminated using the same medium and, also like a book, has been designed for individual use. A CD-ROM, however, can produce new types of textuality due to its memory capacity, its multimedia features and its capacity to enable interactivity (M. Area, 2004:98). The latter characteristic can be defined
as selection-based interactivity: users can build a pathway with the information recorded on the disc, according to their personal usage projects. Access to information is neither linear nor sequential. On the other hand, we have found some disadvantages with CD-ROMs when compared with web-disseminated material. Whereas CD-ROM production costs are lower than those of a book – and, therefore, they are cheaper to purchase – the material offered on the web can be free in terms of access and use. Should payment be required for access and/or for usage, this can be controlled through user identification and password. The possibility of being free-of-charge gives this type of material a greater advantage over CD-ROMs – as well as over textbooks – as it contributes to diminishing the digital divide and, therefore, enhances the democratization of access to new technologies.

**Web resources: education portals**

There are numerous educational websites. Some are informative — institutional websites and databases — while others are formative. Still others are both formative and informative: these are the education portals, which are provided with an intuitive navigation structure, and offer «information, data search tools, educational resources, tools for interpersonal communication, training, advice and entertainment» in a comprehensive manner (A. Cuevas; F.J. Calzada; M.J. Colmenero, 2003). Since their creation over a decade ago, education portals have gradually been incorporated into the language of the education community as a whole, in response to a new reality requiring the immediate inclusion of Information and Communication Technologies (ICTs) in today’s education. In our region, education portals emerged as a consequence of «the governments’ need to disseminate..."
their education policies and bring together the education community in a single virtual space», explains Diana Romero (2008), editor of the Education Portal in Medellín, in her article “El Auge de los Portales Educativos” (The Boom of Education Portals).

In the case of European education portals, their objective is to «promote the use of ICTs in education at European schools, especially by encouraging and supporting cooperation between schools in Europe; offering didactic-pedagogic material and services; supporting the development of teachers; exchanging experiences and examples of good practice; agreeing on and standardising activities.» (U. Lundin, 1998).

In a review conducted with education portals that are part of the RELPE Network we were able to identify similar principles, objectives and purposes in the development of web spaces where the aim is to promote learning and facilitate access to new ways of thinking in teaching, in this case, building
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capacity through the use of ICTs. In Uruguay, the portal that represents us as RELPE members is “Uruguay Educa”, whose team members are teachers from all of ANEP sub-systems (Early Childhood and Primary Education, Secondary Education, Technical and Professional Education Councils, and the Directorate for Teacher Training and Professional Advancement) and provides a wide range of resources. Another major Uruguayan portal is the CEIBAL Portal, which offers its own educational resources – in particular, learning objects and treasure hunts – through an inter-institutional team. It also provides projects and opportunities for exchange to strengthen the whole community connected through the Plan CEIBAL.

Portals are aimed at education communities (students, teachers, managers, researchers, families) and their strength lies in the quality and variety of learning resources, concentrated in a single site. Amongst the educational resources provided by education portals to visitors, there are presentations, multimedia material (images, videos, audio), learning objects, treasure hunts, WebQuest and educational software, all of which can be accompanied by methodological proposals aimed at making a better use of the resource. In addition, the portals provide games – mostly educational – articles and interviews with experts, research information and interesting links.

Romero (2008) believes that «for teachers, portals represent a source of interactive resources that can be used in the classroom with their students, while they are also a source of information for projects and research on education. In addition to this, they also serve as a meeting point for peers.»

In the case of students, she suggests that education portals are «a specialised source in the search for school assignments, a meeting point for teachers and students interested in the same topics, a place for entertainment and leisure due to tools such as electronic mail, chat rooms, forums, games, etc.»

Whereas for parents they «are a place for consultation on topics relative to their children’s education and, in addition, they represent a source of information and advice on how to raise their school children.» (D.C. Romero, 2008).
Collaboration and exchanges in learning

The Internet has transformed itself into the Web 2.0 which, in brief, is a new way of participating in the Network. It is no longer enough to access information and download it; tools allow us to communicate, produce and share new information. For this reason, education portals represent the ideal point of access to education communities; networks of teachers and students who exchange their experiences and thoughts, who also develop digital resources collectively and make them available to the global community so that they can be modified and improved. Education portals are thus conceived as new spaces for communication and collaboration between different actors in education communities, always aiming to improve the quality of teaching and learning processes. It is clear that from the very beginning the Internet was conceived to facilitate collaborative work; the worldwide web stemmed from the idea of interconnecting computers; therefore, Internet collaboration has been playing a decisive role from the outset; it was generated to enable resource-sharing activities. Portals provide us with an excellent opportunity to do collaborative work. Through collaborative learning it is possible – using the tools made available on the portals – to walk alongside other individuals who share our same concerns though they might not share our values or ideas because they are part of a different culture. Collaborative learning can be defined as the socio-cognitive process that is structured on the basis of another individual (in this case, supported by technology) as well as strategies to
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foster the development of combined skills (learning plus personal and social development), where every member of the group is responsible both for his/her learning as well as for the learning of other group members. The basic elements are: positive interdependence, interaction, individual input and personal/group skills. Portals provide scenarios that advance social interaction by providing more communication channels and content with a wealth of learning materials. These collaborative and collective construction attitudes are merely incipient for the majority of the teachers. They entail new teaching practices that imply abandoning the traditional isolation of primary and secondary school teachers to become an active part of a whole that grows and is nourished by the experience and training each has received. In a few years, however, building innovative resources collaboratively and learning from the experiences of physically distant colleagues might become daily practices facilitated by a new teaching reality, by participating in an innovative education process that is only just beginning.

physically distant colleagues might become daily practices facilitated by a new teaching reality, by participating in an innovative education process that is only just beginning.

“In fixed desk, collective table”... Learning networks
The incorporation of technologies in formal education has been marked by different occasions when momentum was gained, but not always sustained over time. During the course of pedagogical discussions initiated twenty years ago, during the Computer-Assisted Education boom, it was thought that computer-based methods would drastically change education; this idea even led to concern on the part of teachers who felt they might become redundant. Since then, many different education models have visited our classrooms and they frequently appeared to be methods that would revolutionise our teaching practices definitively. Nothing could be further from what actually happened. So far, technology – IT especially – had been left out of the classroom; either because IT classrooms were kept locked or because their use was limited to the IT teacher, or to innovative teachers, who were always a minority.
Those who have worked as computer skills teachers in general agree that it has been very difficult to coordinate classroom activities with primary or secondary school teachers, and even more difficult for them to achieve “appropriation” of a class. In short, many teachers had computers at hand but very few adopted them for their own use. «Rather than becoming a force to undermine these old-fashioned school practices, computers were assimilated (…) Thus schools took up what could have been a revolutionary tool and turned it into a conservative tool.» (S. Papert in D.S. Bennahum, 1996). We understand, however, that the present situation can be radically different with the incorporation of XO laptops into the classroom.

On this occasion, computers have “overrun” the classroom and the teacher must coexist with them on a daily basis. This reality combines with the fact that pedagogical discourse also includes – although it is not always applied, in practice – the importance of collective work and the building of knowledge. The XO laptop has specific tools to access information and share tasks, apart from a series of activities that facilitate its use in the most varied of daily class assignments. Julio Castro wrote his book *El banco fijo y la mesa colectiva. Vieja y nueva educación* (The fixed desk and the collective table. Old and new education) in 1941 (it was published in 1942). We understand that the dichotomy of the time – symbolised by the image of a desk fixed to the floor, representing the isolation of the learner, while the collective table was an image representing interaction with the group – can today be approached from a new perspective. More than sixty years after the first publication of his book, many classes are still being delivered in a unidirectional communication modality: from the teacher to the student or with some feedback instances that include teacher-student-teacher.

The incorporation of computers with these new functions suggests that all these ideas with regard to interaction and collective work present new possibilities. Interconnection allows access to large amounts of information which is like having an...
enormous library in the classroom providing images and audiovisual resources. In addition, the tools of the so-called Web 2.0 allow the students to generate information themselves and share it with the world. In this way productions that in the past were limited to the reading of teachers, now include new interlocutors. Collective work as depicted by Castro around his table has now expanded, since it can be carried out with the participation of students in different classrooms or students located in different places beyond the school walls. This means that we are abandoning the enclosed classroom and approaching new learning networks. The conditions, therefore, now exist from the standpoint of technological capacity, pedagogical discourse and technological context. Yet this does not mean that practices will change radically overnight. Teachers will continue to innovate on the basis of these realities but also on the basis of their daily practices.
Mario Kaplún (1998) it is important to be careful not to transform the so-called “banking education” into “an ATM education”. We are certain that there is fortunately no turning back along the path we are treading and that this will allow the school, at long last, to become attuned to 21st century realities.
RELPE (Latin-American Education Portals Network) is a Network of national, autonomous, public service and free-of-charge portals, appointed by the Ministries of Education in every country in the region.

2 In the socio-cognitive perspective, the active presence of another person is necessary, as this second person can facilitate socio-cognitive conflict processes; otherwise, there is no learning but merely an accumulation of information.

CHAPTER 7

Learning and Curriculum Plan CEIBAL and its impact on Middle School
Uruguay is experiencing a time of change, of profound economic and social transformations; essentially – in its conception of country. The country is heading towards a development which will ensure a decent future for all. This well-being must be based on education, culture and knowledge, which will guarantee opportunities for self-development for all children and young people, regardless of where they live or their socio-economic status. Education can make a strong contribution to a country’s transformation. Yet education on its own is not enough; the will and the commitment of the whole of society are required to generate change.
A shared vision is needed; a vision of the future of education. Society needs to believe, to have confidence that its decisions and its investments are those the country needs. Educating for a democratic society has a cost because education has a cost, as does democracy; and societies must be willing to assume jointly the cost of policies and institutions which produce the social conditions to achieve a high-intensity democracy. Democratic education implies a kind of social inclusion which will generate and reinforce bonds between equals (bonding), as well as those which take place between different people (bridging). Uruguayan society, through its democratic institutions, decided to develop Plan CEIBAL as a socio-educational plan. Plan CEIBAL strengthens links, since it not only provides children and teenagers who are culturally, socially and economically different with levelling device, but it also enables communication and the creation of networks. The first condition for intense democracy is the equality of bonds; equality with dignity. If there is no horizontality, there is no education.

Three visions of education
A quick look at the literature available today shows that there are a variety of authors, who provide us with a concept of education on the basis of mission, environment and bonds. Edgar Morin believes that the mission of education in the planetary era is to strengthen conditions to make possible the emergence of a global society composed of protagonist citizens who are aware and critically engaged in the construction of a planetary civilisation.
Noam Chomsky states that it is important to provide the richest and most challenging environment possible for children, so that their creative impulse can develop to the utmost. Josefina Semillán Dartiguelongue considers that educating is an invitation to being to foster enthusiasm about being a person. To be a human person implies building bonds, building communities, building an “us” we call class, school, country. The first way to educate is to create bonds. Plan CEIBAL is an invitation to bring together these three approaches to education, inasmuch as it promotes a suitable environment for creativity, in order to educate protagonist citizens who are committed to the collective construction of a society. Education is not a problem of schools and educators. Education is a commitment the whole of society must undertake. This responsibility and commitment must be undertaken because education is shaped by all of the educational
ICTs themselves seldom act as catalysts for change in schools; however, they can constitute a powerful lever with which to carry out planned educational innovations (in R. L. Venezky; C. Davis, 2002:13).

Reconstructing the society-education relationship

Uruguay faces a major educational challenge in its middle school system. The middle school crisis is the result, amongst other causes, of the absence of meaning, for students and teachers as well as for society, whose confidence has been lost. The great impact of Plan CEIBAL could be to rebuild the relationship between society and education. The XOs act as transitional objects which produce feelings of trust. Society again pins its hopes on an object which symbolises transformation and reencounters. This object makes it possible to venture to change, to break away from traditional models. A new object has come into existence, with which it is possible to generate new content and new proposals and which acts essentially as a motivator.

This is, therefore, an opportunity to integrate computers and innovative educational practices. However, the transformation of practices is not determined only by the fact that XOs have arrived on the educational scene, but by strong educational, academic and didactic proposals.

The opinion of 1st year middle school teachers is added to the general perception of the impact of information and communication technologies in teaching: they broaden the possibilities of access to information, a variety of resources, teaching styles and motivation in general.

ICTs themselves seldom act as catalysts for change in schools; however, they can constitute a powerful lever with which to carry out planned educational innovations (in R. L. Venezky; C. Davis, 2002:13).
ICTs: a hope for the future
Responsibility shared by the whole of society leads to a demand to adapt to the new worldwide, regional and national scenarios.

According to a report by the Ministry of Industry, Energy and Mining, Uruguay – and the region – is currently undergoing a substitution stage in which ICTs are taking the place of capital and labour “without significantly increasing the added value of productivity”.

According to ECLAC, the challenge for the region is that ICTs should contribute to economic growth, increasing productivity, if combined with the training of human resources and changes both in management and in institutional settings. The report states that the creation of AGESIC and Plan CEIBAL contributes to improving and facilitating access to ICT.

In 2008, Uruguay was identified by Gartner Consulting as one of the investment destinations for the information technology (IT) market, because of its system of education, as well as nine other characteristics (in Gabinete productivo, 2009).

At present, the software chain of production is heavily concentrated in the south of the country, particularly in Montevideo. Plan CEIBAL provides a first approach to technology as an integral part of the world. Early use makes it possible to envision a future in which the development of ICT strengthens its scope. Currently, teleworking is already viewed as a work option in the northern departments and, therefore, there is a need for tertiary courses in that
The challenge in the 21st century is to combine equality and diversity, making them complementary and not antagonistic.

Educational inclusion, an ethical principle
In middle schools in which Plan CEIBAL has been incorporated into the education project, educational inclusion can be seen in its attention to diversity. The challenge in the 21st century is to combine equality and diversity, making them complementary and not antagonistic. It is on the basis of this combination that a non-exclusive education can be built. The institution and the classroom, understood as a community, base their practices on coexistence as a guiding principle. New pedagogic proposals tend towards the establishment of peer-to-peer production communities, as pointed out by Piscitelli. Peer groups take on joint projects, which can be divided into small tasks; each member of the group takes responsibility for one of these. Thus, such strategies as the “spelling mistake hunt” emerge. The greatest strength of these communities resides in encounters between diverse, yet equal peers. Their capabilities are different, but they are equal in rights and dignity. Learning should be based on a common, shared language, capable of promoting coexistence and of generating common values. ICTs offer an opportunity to broaden communication with families and encourage support and continuing education in the home, which promotes inclusion and bridges the digital divide. Diversity is, therefore, an ethical principle.

Innovation in the redefinition of education
The pilot experience carried out in middle school in 2009 made it...
possible to identify the leverage points which support the changes taking place. The 1:1 modality is included in the school’s plans for improvement and is not merely a technical issue. Any problems arising are identified and strategies are designed to solve them. The 2007 teacher survey showed that the most frequent uses to which teachers put computers are e-mail and data search. Training and updates for teachers have involved both handling ICTs and their use for educational purposes; a use which has now increased significantly.

Schools and teachers are aware of the need to intervene pedagogically in the searches students carry out through the web, in order to promote a critical form of reading which will detect inconsistencies and ambiguities. The wide array of educational material available in non-proprietary formats places innumerable resources within a teacher’s reach. There is also a range of different alternatives with regard to the design of learning objects on the CEIBAL Portal. Through the contributions of specialists in the new technologies, the coordination of a school has become a collaborative area for research and reflection on classroom practices and ICTs, in which teachers can share their fears and certainties regarding these new technologies in a secure and supportive setting.

The process involving a constant search for contributions to the solution of problems and problem-posing practices is carried out with the support of computer science teachers as the school’s technological role models. Changing educational practices implies changing oneself and one’s context. At present, students spend more time in school, leave class with their XOs to continue using them during break and have substituted their homework copybooks for online assignments. Education settings need to undergo transformations, involving both buildings and furniture, in order to adapt to the new circumstances and requirements of use.

The use of ICT as educational innovation is present in its originality, creativity, ethical commitment, critical reflection, negotiation and an agreement to improve, in order to achieve the broadest possible learning.
Laura Motta

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References


Plan CEIBAL in Uruguay

CHAPTER 8
Seventh, eighth and ninth grades in the face of a new technological and institutional paradigm
Introduction
What changes can be made in the teaching-learning processes for seventh, eighth and ninth grades in rural education as regards the Plan CEIBAL? What aspects can be encouraged for a rapid integration of the technological and the educational/institutional spheres? Regarding the first question, the support and academic assistance group for rural school experiences with seventh, eighth and ninth grades has set as its main objective to guide the work of teachers according to the following core themes: the impact of ICTs in the production of scientific knowledge and its implications in the teaching of different fields of science; the structuring of thought and the development of higher psychological functions given the different uses of language in the Internet and of virtual language; the new competence required of teachers and students in learning environments enhanced by ICTs; XO laptops and their potential
in the development of “naturalist intelligence”.
Regarding the second question, it has been seen that newly introduced technologies can neither progress nor work to their full potential if this incorporation is not accompanied by organisational, institutional and educational changes. For this reason, good practices associated with the new technological paradigm must be communicated, exchanged, discussed and taught. This allows for the emergence and generalisation of a new form of common sense and a new institutional culture which is starting to supersede the existing one. Accordingly, what started as technological dissemination permeates the institutional sphere, and a new common sense emerges in terms of how to do, where to do and what to do.

**Development of content**

**The questions**

Developments in the new ICTs in the context of a knowledge-oriented society are leading to a change of paradigm in both technological and economic spheres, as well as in institutional and organisational spheres. Technological changes tend to occur more rapidly than institutional changes; therefore, a mismatch between these two spheres frequently becomes evident. Institutional and organisational modifications that require a change of technological paradigm tend to be slower (C. Pérez, 2004). It is easier to produce changes in objects than to do so in cultures, organisation modalities, forms of communication, teaching and learning processes.
The Plan CEIBAL implies a technological change that runs parallel to new global paradigms. Yet this requires some modifications at organisational and institutional levels. In this article we will attempt to answer the following questions: what changes can really take place in the teaching and learning processes at the level of seventh, eighth and ninth grades in rural schools, drawing on Plan CEIBAL? What aspects can be encouraged to secure a quicker connection between the technological sphere and the educational-institutional sphere?

Seventh, eighth and ninth grades in rural schools: main characteristics
The experience of seventh, eighth and ninth grades for students in rural schools with difficult access to other education centres began implementation and development in 1999 with the following objectives: to enforce the compulsory Ciclo Básico (3 years of basic secondary education); to provide equal opportunities to all students nationwide; to assure access to secondary education in rural areas; to increase the democratisation of knowledge.

The development of this education modality requires the presence of two resident teachers. One of them is responsible for the area of language and social science while the other specialises in natural science and mathematics. Each of them receives classes geared to specialised knowledge in the areas and subjects they teach as well as in the specific field of educational delivery. During the courses, these teachers are supported by a team of specialists. By March 2008, 477 teachers were part of the experience carried out in 62 education centres for 2248 students.
What changes can be made in the learning process for seventh, eighth and ninth grade in rural schools, in the framework of Plan CEIBAL?

Current technological developments call for the construction of new educational environments where students and teachers can reaffirm the reason why technologies have been incorporated into the classroom. It is felt that those educational environments should favour the different uses of technology, always bearing in mind that technologies are not neutral and that their instrumental nature cannot be separated from general and specific education objectives.

It becomes necessary, therefore, to interpret technology in the context of the reality of the education community, consisting of rural schools that participate in the experience of grades seven, eight and nine. In addition, it is fundamental to foster an atmosphere where education proposals are generated to encourage new knowledge-building modalities – different in quality and valid from the standpoint of the school subjects – so that they are part of the academic, personal and social education of the learner. In other words, the teacher must generate teaching practices whereby ICTs acquire a new relevance as they relate to knowledge and the understanding of reality.

Accordingly, the group that provides academic support and assistance to the experience of rural schools in seventh, eighth and ninth grades, considered a priority to orient the work of teachers around the following thematic areas: the impact of ICTs in the production of scientific knowledge and its implications in the teaching of different sciences; thought structuring and the development of higher

Developments in the new ICTs in the context of a knowledge-oriented society are leading to a change of paradigm in both technological and economic spheres, as well as in institutional and organisational spheres.

<table>
<thead>
<tr>
<th>Teachers</th>
<th>Number</th>
<th>Area</th>
<th>Council</th>
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<tbody>
<tr>
<td>Primary School Teachers</td>
<td>169</td>
<td>Language and Social Science</td>
<td>CEP</td>
</tr>
<tr>
<td>Primary School Teachers</td>
<td>169</td>
<td>Mathematics and Natural Science</td>
<td>CEP</td>
</tr>
<tr>
<td>Secondary School Teachers</td>
<td>66</td>
<td>English</td>
<td>CES</td>
</tr>
<tr>
<td>Secondary School Teachers</td>
<td>73</td>
<td>Technology</td>
<td>CETP</td>
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<td>Total</td>
<td>477</td>
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psychological functions on the basis of different uses of the language on the Internet and of virtual language; the new competences – of both teachers and students – in the learning environments favoured by ICT; XO laptops and their potential in the development of “naturalist intelligence”.

As regards the impact of ICTs in terms of knowledge and the teaching of science today, we insist on stressing the importance of keeping research and teaching together, as these are not conflicting activities and they share a lot in common, though their outcomes may be different. It becomes evident that education should also take place in creative environments and furthermore, in the presence of a permanent Technological Revolution that obliges us to pay special attention to the goal of lifelong education and, in addition, highlights the concept of learning to learn (R. Arocena, 2002). It is within this framework that we wish to present the impact of new technologies; from the point where much of the scientific knowledge that affects today’s society is developed. The idea of what science is and how scientific knowledge is generated over time has simultaneously given place to a certain way of understanding how people learn; and when considering both variables, certain strategies or ways of teaching science have been deduced (D. Gil Pérez, 1986). In light of these relations hips, we have analysed different teaching and learning models used by teachers in the classroom, though they have not always been aware of their epistemological and psychological foundations. Today, unlike the more traditional approaches, the central focus in the teaching of science goes beyond the knowledge “revealed” by specialised fields where “learned” knowledge is generated. The ways or modalities of “doing science”, which allow us to reach that knowledge, are also taught. If the characteristics of science are used as a source of inspiration for its teaching, these considerations will affect multiple aspects of teaching: its objectives, the
choice of content, of resources, the importance of addressing students’ prior knowledge, work dynamics in the classroom, etc. «Learning science is identified – to some extent – with practising scientific work, finding out, in addition to handling concepts and models; that is, being immersed in what we call a scientific culture» (ANEP, 2005). Consequently, teaching science in an educational context is not limited to doing practical work but also implies aspects such as data selection, data recording, knowing and discussing different ideas, choosing between different explanations, evaluating alternatives, communicating conclusions to other people. Many of these processes have to do with how to organise the search and organisation of what is now global information. Making data-related decisions, discussing what data reveals, supporting a decision, are all teaching strategies related to and consistent with the discourse of science and the access provided by ICTs. The
epistemological aspects we have mentioned in part provide a rationale in terms of the importance of introducing activity lines in the classroom which will encourage the student to research the close ties between science and technology – including ICTs – and, in addition, understand the scope of XO laptops, how they function, how valuable they are in the school context, apart from their potential impact in training an individual to become both a citizen and a person. The school has traditionally been identified with formal education – among other functions – logical, analytical and abstract thinking through a more universal language. Despite these objectives, we see difficulties in and out the classroom when students attempt to attain higher levels in language and thought. This lagging behind in terms of symbolic representation can be attributed to different causes – social and cultural – some of which are disconnected from education while others are not. The development of the higher mental functions is often affected by these situations. The opportunity that XO laptops provide to foster the development of thought and a wider use of the language has to do with how we interpret these tools in our own reality. The XO laptops pose some new questions, as well as others that are not so new. The link between technology and schools is not new; however, the peculiarities of XO laptops and their scope of possibilities make us wonder how their incorporation should take place in the school and what their

The opportunity that XO laptops provide to foster the development of thought and a wider use of the language has to do with how we interpret these tools in our own reality.

encourage other inquiries and challenges concerning how to achieve this. With regard to structuring thought and the development of higher psychological functions we should review the relationship between school and technology. This entails trying to where certain elements associated with certain modalities of thought (formal language-scientific thinking). This was and is manifested in terms of intention, both in primary and secondary education, as set out in the objectives of their plans and programmes; promoting
impact will be on the curriculum. The “world” has actually entered the classroom through the laptops and this means that we should be thinking of designing a curriculum that embraces this new situation and reinterpreting the traditional goals and objectives of education from a broader perspective that is not merely instrumental. The presence of laptops in the school is a reality we cannot ignore; if we perceive them as just another resource, we run the risk of allowing ourselves to be manipulated by them. Through these laptops, the student can access new forms of knowledge and the sort of language which is not always that which is sought by formal education. Given this wide choice of possibilities for the young, indifference is not the right answer. Therefore, determining the use and value of laptops in each education centre implies reformulating objectives, goals, profiles, as well as formulating actions, strategies and evaluation modalities that move away from the traditional, because spaces and time are different. Yet, on the other hand, the XO laptops provide new opportunities that expand and enrich conventional teaching and learning approaches.

From books to XOs, teacher-student interaction assumes a new dimension due to hypertext reading. In other words, the new and varied modalities with which to organise discourse provided by XOs require teachers to reconsider their role in the field of education, in terms of students and their environments. The requirements and challenges posed by these realities call for a reaction on the part of education centres so that bridges can be built between traditional and new technologies. The incorporation of laptops is seen in the schools as a technology that – depending on the
use and value assigned by each institution – will/will not favour the development of higher psychological functions and, therefore, formal language. It has frequently been pointed out that between traditional means and XO laptops there are cultures that imply different modalities of constructing information and knowledge. The following preconceptions illustrate this notion:

<table>
<thead>
<tr>
<th>Books</th>
<th>XO laptops</th>
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<tr>
<td>• Linear and sequential.</td>
<td>• Non-sequential.</td>
</tr>
<tr>
<td>• Analytical, logical and rational thought.</td>
<td>• Intuitive and synthetic thought.</td>
</tr>
<tr>
<td>• The written word predominates.</td>
<td>• Images predominate.</td>
</tr>
<tr>
<td>• Formal variety is privileged.</td>
<td>• Colloquial variety is privileged.</td>
</tr>
<tr>
<td>• Argumentative discourse mode.</td>
<td>• Narrative discourse mode.</td>
</tr>
<tr>
<td>• Symbolic resources.</td>
<td>• Iconic resources.</td>
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However, this characterisation stems from a viewpoint where the media are seen from an antagonistic perspective, where generalisations may bring discredit to the use or value of one medium over the other. In fact, books and laptops share many of the characteristics mentioned above and promoting any one characteristic in either medium will depend on our own
In fact, books and laptops share many of the characteristics mentioned above and promoting any one characteristic in either medium will depend on our own attitude. In short, if access to technology does not go hand-in-hand with clear purposes relative to the development of students’ potential – thought and language – it will become useless and meaningless.

by research in education and several studies. From didactic and pedagogical point of view, some of the benefits or potentialities of ICTs to justify their inclusion can be summarized as follows; they:

i) contribute to significant learning on the part of students and to the reflexive construction of their knowledge;

ii) facilitate personalized attention and feedback of teaching processes;

iii) promote critical scientific literacy;

iv) develop multiple procedural and cognitive skills in students;

v) encourage self-learning and the autonomous work of students;

vi) build on collaborative work between students and with teachers;

vii) increase possibilities of incorporating new and diverse information to solve problems and explain natural and social phenomena;

viii) favour the socialization of classroom work with the student’s family.

As indicated above, the use of ICTs is not in itself a guarantee of significant learning, though it may seem to have a favourable effect on motivation;

attitude. In short, if access to technology does not go hand-in-hand with clear purposes relative to the development of students’ potential – thought and language – it will become useless and meaningless.

An analysis of the new competences – of teachers and students – in learning environments enhanced by ICTs must consider the presence of a new culture, a new way of being, thinking and communicating through audiovisual media – and the ICTs – incorporated in both students and teachers in different degrees. In the education community there is agreement as to the common goal of using ICTs as an additional tool that will help overcome problems related to teaching and learning and which have been pointed out
teachers know that this effect may suddenly disappear when technological devices are no longer a novelty for the students. On the other hand, the opportunity to access increasing amounts of information on a daily basis does not necessarily imply greater learning possibilities. Undoubtedly, it is difficult to build knowledge without information but simply gathering information is not enough to build knowledge. Certain points of support are necessary to enable an analysis of all this information in order to understand it. Teachers may help create these points of support so that each learner can build and rebuild them and move ahead in terms of his/her conceptual and methodological profile. These processes are triggered when opportunities are offered to search for answers, solve problems or face challenges that imply questioning our own knowledge and experience. Teachers will also be responsible for coordinating and planning timeframes collectively so that students have the opportunity to integrate the fragmented knowledge they have been building in each school subject. This is neither an inherent capacity nor an ability. The idea is for the collaborative learning experience to develop at two parallel levels: that of the teachers and that of the students. In this way, the dimension of collaborative learning is two-fold: students collaborate in order to learn and they learn to collaborate. Unlike group work, in collaborative learning, leadership, responsibility and goals are shared (M.P. Prendes Espinosa, 2000). In short, from this perspective, the use of ICTs in education represents one of many tools available that requires teachers to focus their efforts on what really defines them, which is not in fact teaching, but rather helping learners to learn. It is now relevant to develop some ideas regarding the XO laptops and their potential to develop naturalist intelligence. XO laptops may become a resource that allows to observe the diversity in teaching processes, provides opportunities to diversify classroom proposals according to different learning paces and styles, and even address “multiple intelligences”, as suggested by H. Gardner (1983).
leadership and especially interest and motivation to learn. These multiple intelligences may be developed during science class but, in particular, they can be conceived as cross-cutting development drivers and cover other knowledge areas as well. One of such areas is what Gardner calls “naturalist intelligence”. It may sound paradoxical to suggest that information and communication technologies may also serve this type of intelligence, which is characterised by: i) recognizing the interaction between the physical environment and living beings; ii) observation with all of the senses, favouring the development of an inter-disciplinary mind, and requiring concentration, constancy, development of curiosity and enthusiasm for the natural world; iii) integration and communication of perceptions from the natural and human world; iv) identification of predictable models for interaction and behaviour; v) application of perceptual abilities such as comparing data, establishing
relationships, distinguishing patterns, classifying characteristics, making inferences, deriving meaning, etc.; vi) formulating and testing hypotheses; vii) experimental model design; viii) control of variables; ix) development of an inquisitive frame of mind. The following are some possible XO laptop applications to develop naturalist intelligence:

- **Simulation programmes** are based on models representing the functions of a given system. Interactive programmes are particularly interesting as they allow you to modify system variables and obtain results that reveal the influence of such variables. They are recommended for systems that are difficult to address in the real world: www.educa.madrid.org/web/ies.garciamorato.madrid/Fis_Qui/webquest.html

- **A virtual laboratory** is an instrument designed to learn experimental problem solving and can be very useful as a complementary resource to laboratory practices. The main goal of the virtual laboratory is to be a useful instrument when learning to design experiments and integrate theoretical and practical concepts in different school subject. For example: Virtual microscope: micro.magnet.fsu.edu/primer/java/electronmicroscopy/magnify1/index.html

- **A virtual approach to scientific research centres** allows communication with national and foreign researchers, processing real
databases for research projects, access to ongoing research documents, etc. For example: with the help of a browser, it is possible to access different research schools and institutes. www.fcien.edu.uy; www.iibce.edu.uy

- **Tutored programmes and activities** include information, exercises, problems, etc., as well as self-evaluation strategies that help in the self-regulation of learning. http://groups.google.com/group/ticsaplicadas/web/recursos-tics-ciencias-naturales

- **Educational proposals presented in education portals.** In 2008, Uruguay launched *Uruguay Educa*, its education portal, containing resources, tools and digital content for teachers, students, school managers, researchers and families. www.uruguayeduca.edu.uy

- **A platform or site created by the teacher or the students themselves** through which they can communicate with other students in remote places, exchange work, develop research activities and work as if there were no geographic boundaries.

- **A virtual “Library”,** in order to enjoy a learning environment that enables students to access information and its self-learning processes. In this space, the teacher can introduce information from assorted sources and the students themselves, in coordination with the teacher and classmates, can select publications, documents, etc. In addition, students can become involved in devising categories and different ways of organising their library.

**What aspects can be promoted in order to achieve a faster connection between the technological and the educational-institutional sphere?**

During the inception stage, new technologies are progressively deployed. Later, we realise that these new technologies cannot advance or work at full capacity if they are not accompanied by organisational, institutional and educational changes. Some examples can be mentioned as to how XO laptop deliveries to primary students, and now to secondary students, are moving into and transforming institutional areas.

- The places of learner and teacher are being occupied by different actors. Thus the traditional teacher-teaching and student-learning relationship is now combined and we see situations where students teach their teachers and where primary school teachers teach secondary school teachers, where children and teenagers teach their parents, where clerical and maintenance personnel learn from students and teachers, and the other way around.

- School buildings and equipment also present challenges. More flexibility is surely needed in this context. From the very essentials,
such as tables and benches which can be placed together or separated, electrical installations providing safe power connections for computers, recreational spaces that allow for the comfortable use of laptops, classrooms with working areas that can be adapted to the class dynamics.

• The administrative organisation of the school receives the impact of students who are a constant presence along corridors and up and down stairs; who film and take pictures, leave their classrooms – or even the school – and later return; all during class hours, in order to complete the assignments they are working on.

• Both the teaching and the learning process must incorporate copybooks, textbooks, school stationery and the XO laptops. They must also combine proposals that include individual, collaborative work and networking.

• Communication between students and their teachers and between students will no longer be merely oral. Now it can also take place in a portal, on a blog, and via electronic mail.

In this way, the new technological paradigm gradually enters the institutional sphere and, in general, the former paradigm is seen as an obstacle and no longer as a source of security and certainty. The level of consensus, agreement and disagreement, respect and positive construction will determine the rate of change. Yet one thing remains clear, the construction of this new modality does not imply breaking away from the previous one but rather relying on its core, universal and timeless principles to achieve a symbiotic bond with the new modality and give way to a new model.
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1 Typology of intelligence proposed by H. Gardner: verbal, linguistic, spatial, bodily/kinesthetic, musical, interpersonal, logic-mathematical, naturalist.
CHAPTER 9

Territories under construction
Training teachers
The expansion of computer use in state school classrooms as a consequence of Plan CEIBAL in primary education and the early years of middle school, gives rise to new scenarios which are perceived as a source of both concern and opportunities for the professional growth of teachers. As schools are equipped and the presence of these technological resources in daily life spreads, it is increasingly difficult to enclose computers in a computer lab and to decide when teachers can, or wish to include them in their work. This generates strong tensions in a profession which is only now breaking away from the traditional view that control of information and written culture are seen as key. The use of the resources provided by the new information environments is conditioned by the view that teachers continue to have of their own profession and knowledge. After Plan CEIBAL was set in motion, state education became involved in a
The use of the resources provided by the new information environments is conditioned by the view that teachers continue to have of their own profession and knowledge.

process of discussions and proposals with a focus on new ways of teaching and learning in the context of this society, which is marked by profound economic, social and technological changes. These discussions had been intense during the eighties and nineties, but had been silenced by an educational rationale in which the predominating curriculum content was marked by teaching the use of software and the absence of a critical view of these technologies. However, the discussions which are now reemerging are not about the inclusion of computers in the classroom – they are focusing instead on the best way to incorporate them into teaching (J.M. García, 2009), on opportunities for updates and teacher training which should be put into practice and on the changes taking place in schools.

An example of this is the vision of the state school and its relationship with information, which is described in CEP’s new Early and Primary Education Programme, 2008: «In consequence, schools must redefine some of their roles, particularly those in which a position has to be adopted in the face of information. It is essential to overcome the utilitarian demands proposed as a priority in the knowledge era: to provide useful information to compete in the real world. A new imaginary should be constructed in order to gain critical access to information within the context of comprehensive education, ensuring appropriate relationships with knowledge in order to foster the cultural growth of the population» (ANEP-CEP, 2009:35).
Launching the Plan and teacher training

Teacher training has been one of the areas most in demand throughout the implementation stages of the Plan, as well as one of the undertakings Uruguay added to the OLPC proposal submitted to the Uruguayan State. It was on the basis of the discussions arising from implementation and observation of the pilot experience in the school of Villa Cardal that teachers became key actors in the process of genuinely incorporating XOs into the classroom.

We are currently witnessing an increase of in-service training in technology. Plan CEIBAL chose this method to train teachers of the Primary Education Council: «CEIBAL has opted to deploy a training strategy which entails training its own teachers in a cascade format, making the best use of the human resources available in the formal education system, who have been receiving training from the system since the eighties, within the context of a variety of plans, programmes and projects, so that they, in turn, can train other teachers.»

In middle school, work is being carried out with role model computer lab teachers, school subject inspectors for CES institutes and secondary schools and regional CETP inspectors. There have also been Plan CEIBAL familiarization activities for teachers in the 1st year of Ciclo Básico (basic secondary education) in both Councils, organised by the Department of Educational Technology of CODICEN, CES, CETP and LATU.

All of these activities respond to the purpose of successfully handling the arrival of the Plan to middle school. To this end, the sessions for role model computer lab teachers are advertised by stating that: «This course has been conceived to foster the presence in school of proactive and innovative teachers who can face new situations and not avoid them for lack of suitable tools. It aims at becoming a framework of reference for the use of information technology in education in the new 1:1 modality which is being adopted with the arrival of Plan CEIBAL to middle school» (Portal Plan CEIBAL, 2009). In middle school, the training strategy also favours the school as the place
where teachers can be trained, and through consultation with inspectors and IT role models seeks to establish work groups to research and experiment in the use of computer resources in the classroom. Gradually, these ideas are trickling through into the discourse of middle school management and education authorities. Thus, Héctor Florit, CODICEN representative for Plan CEIBAL, points out that «institutional work dynamics and requirements should be borne in mind, as well as opportunities for professional update for teachers, the availability of technical and pedagogical support from each inspection and the background of the students who attend the schools in question. The use of IT as a tool should be constructed by each education community» (Info Educar, 2008). Another of the ideas which is gaining ground is the multiplicity of actors linked to training in education and technology. In the face of the enormous demand, these actors are
not only present within the National State Education Administration; over the course of the last two years, the Network of Volunteers in Support of Plan CEIBAL (RAP in Spanish), the University of the Republic and organisations of free software users have organised courses, workshops and conferences in response to the demand for training. The four conferences on education and ICT held in Florida, Colonia, Salto and Montevideo are an example of this.

**Basic training**
Researchers and trainers agree on the central role that basic training opportunities have in this process of reconstructing the educational and political nature of teachers’ relationship with the new media. These opportunities are starting to avoid the “technological training” slant, in which the emphasis is on handling new equipment and software, to the extent that in some cases, the course programs only offer a list of software packages to be taught.

The teacher training system, particularly in the area of primary education, has set up a Project in Support of Plan CEIBAL Technology, within the framework of which “Technical-Educational Training Conferences in the Technology of Plan CEIBAL” were held during the course of 2008. Participants were computer lab teachers, heads of teacher training practice schools, computer science teachers and Plan CEIBAL role model course teachers from the Teacher Training and Development Directorate (DFPD in Spanish). Two “Technical-Educational Training Conferences in the Technology of Plan CEIBAL” have already been held in 2009. The basic concept underlying this work is that of a strong relationship with in-school practice activities: «The strategy designed by DFPD focuses on training teachers and students in the specific elements which come together on the basis of technology and didactics in the educational innovation implemented within the context of Plan CEIBAL» (ANEP-DFPD).
During the course of the 2009 academic year, there will be XO laptops for students and teachers to work with in all of the DFPD centres. XOs have been in use in primary education teacher training institutions throughout the country since 2008; now, Instituto de Profesores Artigas (IPA) and the Regional Teacher Centres (CeRP), both secondary education training institutions, will also be provided with them. Despite an increasing tendency to include education and technology-related content in basic training, this issue does not yet have a prominent place in teacher training plans, or in the assessment of content to be worked with by teacher trainers: «...Aguerrondo and Vezub’s research (2003) in teacher training centres showed that trainers placed learning new technology last on the list of priorities for basic training» (M. E. Mancebo, 2006:230-231).
Building new professional competencies and identities

The development of Plan CEIBAL in all of its dimensions – access to equipment, connectivity, training plans, new content – is added to the process of change being proposed by a new institutional structure and the current requirements of Uruguayans regarding teacher training.

Teaching is opening up to students who previously had no access to it, there is widespread diversity regarding cultural and economic assets with which to face the institutional routes suggested, new institutional formats for primary and middle school education are being tested, there are new ways of relating to the knowledge of students and teachers, and a new relationship is being forged between education and technology... How can teachers be trained to carry out their work under such conditions?

Our training in the use of ICTs encompasses a new way of thinking about the context we learn and teach in, in which these technologies are a key factor, but not the only one. Dealing with conflict; establishing new relationships with knowledge, relating from non-traditional positions in the profession with social agents who used to be foreign to primary, secondary or technical schools; new assessments of inter- and trans-disciplinarity emerge as opportunities for training and updating which we seek to contemplate and respond to.

Many of these answers are yet to be tested, or are still under construction; however, it should be borne in mind that in some of them, some work has already been carried out. In the case of technological competence, teachers already know how to handle information and how to manage
knowledge; aspects which are the foundation of these skills.

- We should take advantage of the knowledge and experience of our professional lives to transfer to students and their surroundings the techniques we use to manage information. The fact that we are all – students and teachers – surrounded by an enormous amount of information which we can access much faster and very easily does not imply that we also acquire the criteria to prioritise, validate and analyse these data. As an expert in these competencies, it is the teacher who can construct the scenarios to bring them into play in the classroom. This entails putting into practice the well-worn maxim about the need to evolve from transmitting knowledge to facilitating its construction.

- Teaching practice is based on watching, copying, testing and making mistakes and it is in this dimension of our work that “knowledge in action” becomes most evident. This is the knowledge that we produce when we face specific situations in which not only our knowledge comes into play, but also our beliefs and assessments of situations as they emerge; it is then that we attempt an answer.

Our training in the use of ICTs encompasses a new way of thinking about the context we learn and teach in, in which these technologies are a key factor, but not the only one.

This is why we need to plunge into the water and start doing; only by analysing what went wrong, or how I can effectively incorporate these technologies into my way of working in class will I be able to appropriate them: decide to what extent and how I shall use them. Being part of work and research groups makes these lessons easier because, as many authors and researchers have already pointed out, it strengthens areas of innovation and enables the analysis of successes and failures from several different viewpoints.

- We should accept the break with deeply ritualised models of “what the class should be like”. We need very flexible class proposals, since the more leeway students may now have makes rigid sequences unfeasible. The new class scenarios provide greater visibility and participation to opportunities for training and updating which we seek to contemplate and respond to. Many of these answers are yet to be tested, or are still under construction; however, it should be borne in mind that in some of them, some work has already been carried out. In the case of technological competence, teachers already know how to handle information and how to manage
the contributions of students. This makes one think of moving from a classroom model conceived on the basis of a receptive accumulation vision, «...in which learning consists of receiving and practising information and skills presented by the teacher» (R. Putnam; H. Borko, 2000:227), to a cognitive mediation model, where the teachers mediate between the information they or their students provide and there is room to explore proposals or ideas different from those which teachers bring to class. Thus, it is not the computer that is the core issue of incorporating ICTs to teaching and learning activities but teachers, how they think and represent their work and how others learn and teach. It is evident that suitable equipment to make these technologies accessible to all is necessary, but it will lack significance if they continue to constitute a practice and language which is beyond the field in which teachers conceive their profession. «Maintaining or modifying a practice in organisations implies working not only on the development of new specific skills, but also working with regard to the context which maintains and nourishes previous practices.» (C. Davini, 2002:26)

Rethinking practices and institutions is one of the challenges we need to face. For this reason, training, research, analysis and discussion, to a varying extent, will have to involve all those who are part of an educational institution: teachers, heads, administrative staff, technical teams, inspectors, planning divisions, authorities, students and the community.

Finding the answers also implies seeking agreement with a variety of actors who, over time, have generated experience and knowledge in ICT-related fields and school subjects, and who are to be found within and without our teacher training centres. There is, therefore, a first move in this trend which is seeking bridgeheads in the complex architecture of the “knowledge society”. Thus, “mosaic” areas emerge; collaborative and
Thus, it is not the computer that is the core issue of incorporating ICTs to teaching and learning activities but teachers, how they think and represent their work and how others learn and teach. It is evident that suitable equipment to make these technologies accessible to all is necessary, but it will lack significance if they continue to constitute a practice and language which is beyond the field in which teachers conceive their profession.

creative social environments where old and new actors – within and without formal educational institutions – come into play. It is impossible to think of change for only one of the actors and it is undeniable that, despite tensions, discussions and debates, the new cultural contexts in which we move make it impossible to take a step back. Therefore, we can only rise to the
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challenge of exchanging ideas and projects, testing and building proposals which will lead to providing socially relevant content and prevent our education system from becoming a means of exclusion.
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CHAPTER 10

ICT incorporation in local development and innovation processes
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ICT incorporation in local development and innovation processes
In our country, policies aimed at the promotion and democratisation of ICTs, designed by the State and NGOs, started in 1985 and 2001 (Zamalvide, 2002). By late 2006 there were telecentres operating under the BIBLIORED (Montevideo Public Libraries Network) modality, as well as the ECI (Citizenship and Computing Schools) centres located in less privileged areas of the city, answering to CDI Uruguay (IT Democratization Committee). At that time, there were no Inter-American Development Bank (IADB) telecentres in the capital city. The IADB signed the following contracts for projects in Uruguay: i) Intelligent Rural Community (10 December 2003) in the department of Artigas and; ii) Rural Salto on the Internet (12 December 2003), although implementation began at a later date. In addition, plans were made for the implementation of a few CASI (Information Society Access Centres) telecentres at the beginning of 2005, under the leadership of ANTEL (the national telecommunications administration), for the less privileged populations (M. Zunini, 2007). It is within this context that we include two articles covering the current situation in the private and public sectors. The first article refers to CDI Uruguay’s ECI while the second features USI (Information Society of Uruguay) Community Telecentres Programme, CASI and the MEC Centres (Educational and Cultural Centres of the Ministry of Education and Culture); all members of RUTELECO (Uruguayan Community Telecentres Network). These literacy programmes with a view to the universalisation of a digital culture seek to build on the capacity of target groups. Thus, equal opportunities are granted to all and the emergence of new social fragmentation is prevented while employability is reinforced in support of national development.
In the remote past, since the first tools came into being, technological products have been a significant factor in human evolution. The more sophisticated the products, the greater their influence in our lives. Yet, that they be used for good or for bad does not depend on the tools; ethics are a human attribute. This is why it is so important for all of us to have access to the best technologies. If these were in the hands of just a few, some groups would dominate others and society would not grow together as one. In the age of knowledge, digital inclusion is the key to social inclusion.

The Committee for Democracy in IT (CDI in Spanish) was created with this premise in mind. It was initially founded by Rodrigo Baggio in Rio de Janeiro in 1995 and then extended throughout Brazil. In 2000, it began expanding internationally and CDI Uruguay was founded. Today, it has become an international network covering eight countries. The pioneering work of the CDI Network, providing access to Information and Communication Technologies (ICTs) to less privileged populations, has been recognised and formally approved by UNESCO.
Mastering ICTs allows access to new sources of knowledge and socialisation, opening up real work opportunities and increased income. CDI proposes the democratisation of new technologies as an instrument for the social incorporation and integration of those who have been otherwise excluded. CDI’s mission is to promote digital inclusion as a way to social inclusion. Their work is carried out by installing Citizenship and IT Schools (ECI) that provide access to knowledge. The aim is to integrate members of lower-income communities more positively into society. Knowledge of technological tools is incorporated through project teaching, in subjects like ecology, health, human rights and any other area stemming from the endogenous needs of individuals and communities. The pedagogical methodology is based on Seymour Papert’s Constructionism and Paulo Freire’s Social Proposal.
«The real magic of digital knowledge is that you can learn everything, the new and the old, in more depth. A core theoretical principle that captures that magic is that learning more can be easier than learning less» (Seymour Papert, in an unpublished article on OLPC).

This is a daily experience in ECIs: when different types of knowledge sustain and nourish each other, providing meaning to learning, it becomes easier to learn them together than separately.

CDI Uruguay is part of the Uruguayan Community Telecentres Network (RUTELCO) together with the Ministry of Education and Culture (MEC) and the National Telecommunications Administration (ANTEL). These institutions encompass all of the Community Telecentres in the country. RUTELCO has signed a collaboration agreement with Plan CEIBAL, with which it shares principles and goals.

CEIBAL is an outstanding undertaking launched by the Uruguayan State in 2007 and is of vital importance for the socio-educational development of the nation. Its strategic principles are equal opportunities to access technology, democratization of knowledge and enhanced learning in schools and in the context of all learners’ experiences.

Some of the goals set by CEIBAL include: to have a significant impact on school-family relationships, to promote the skills necessary for the 21st Century

«We can count how many seeds are in the apple, but not how many apples are in the seed.»
society and to reduce the digital divide. CEIBAL is unique; it is unprecedented. For the first time in the history of mankind, a country provides laptops to all primary school children and their teachers, covering the whole of the education system. The plan was inspired by the “One laptop per child” (OLPC) initiative of the MIT Media Lab, fostered by Nicholas Negroponte, following the educational principles of Seymour Papert. RUTELCO supports CEIBAL in terms of its expansion to families and communities, involving all age groups. The shared goal is to extend the benefits of using computers to society as a whole. This is a very innovative undertaking that reveals the synergy between CEIBAL and the Community Telecentres and strengthens the actions of both projects in favour of social development. All of us who are involved have a great deal to learn during this process; but not only to learn, we also have the responsibility of sharing our learning with society at large. This is true of every new road; it is the essence of progress. Even though we may not have all the answers, we must still walk them so as not to be left behind. «We can count how many seeds are in the apple, but not how many apples are in the seed.» (Ken Kesey, quoted in S. Brand, 1988:17)
The role of MEC Centres and Telecentres and their contributions to Plan CEIBAL

by Roberto Elissalde | Karina Acosta

Owing to its scope, Plan CEIBAL became one of the policies, together with the expansion of healthcare coverage and family allowances, with the highest impact on children’s opportunities, especially of those born into less privileged households. The XO laptops, which reached the most remote areas of the country, also opened windows of opportunity to adults who had access to them.

Today (September 2009), the MEC Centres network covers 90 localities, particularly serving towns with fewer than 5000 inhabitants.

ANTEL, the national technology partner, provides half of the equipment and the computers as well as Internet broadband access, even in areas where copper telephone wires are not available, thanks to technologies that despite being more costly, ensure levels of access similar to those obtained via 3G or Edge. The local partner – the municipal government in each location – provides the premises, the staff (facilitators), and is responsible for safety and hygiene in each centre.

More than just a telecentre, a MEC Centre seeks to be a driving force of
MEC Centres are conceived as a multidimensional projects that is flexible and decentralised, and combines dissemination and enjoyment of knowledge with the necessary social cohesion that allows everybody to have fun in a more meaningful way.

the community it serves, in education and culture, in terms of recreation, dissemination of scientific and technological knowledge and participation in any other activity that may be of general interest to the community. Activities may range from workshops to make Carnival papier maché big heads (*cabezudos*), to joint work at the Culture Factories of the National Culture Directorate; from meetings to stimulate reading habits with the National Education Directorate to digital literacy workshops, all aimed at recovering the
social fabric and revitalising the community.
Over eight thousand people have already participated in the digital literacy workshops. These people today have the basic skills they need to use a computer without fear, create their own accounts, write and receive e-mails, chat and have an idea of the advantages and disadvantages of using the Internet. In all 19 departments of the country, the vast majority of students are women in the 40-60 age bracket.
In certain localities where the Centres have been present for more than two years, as is the case in Florida, demand for regular workshops has declined while the demand for “other knowledge” related to the area of information and communication technologies is beginning to grow. Ever present in the minds of people at the Ministry of Education and Culture is symbolic power of ICTs at the level of social cohesion, granting every person the possibility of feeling “connected”, “part of a network”, both as a consumer
as well as a producer of content. In this area, one of the principal goals of the MEC has been to facilitate technology management learning and foster its critical and creative use. The 300,000 XO laptops currently distributed throughout the country have opened new opportunities to children who five years ago would never have dreamed of owning their own computer. Yet this situation generates some externalities that must be taken into consideration. The first of them is the fact that knowledge-related differences within the family are more evident. It sounds natural to say that computers “are for kids” and younger people. This statement justifies a vision that the future “belongs to them” and not to the older generations.

MEC Centres are conceived as a multidimensional project that is flexible and decentralised, and combines dissemination and enjoyment of knowledge with the necessary social cohesion that allows everybody to have fun in a more meaningful way. For this reason, more than a telecentre, each site is a social driving force. It was necessary to complement the arrival and deployment of CEIBAL with a public policy that would tap into the installed infrastructure of computers and servers.

During the second half of 2008, the Digital Literacy team of the MEC Centres designed a pedagogical proposal especially adapted to adult users, so that they could learn the essentials of XO laptops.

Karina Acosta and Soledad Guerrero produced a Digital Literacy Manual for XO Users with its corresponding Trainers’ Manual. Since 2009, with the support of ANTEL and LATU, the Centres have incorporated two computers and wireless routers that emit signals that can be received by the XOs. The connection is made directly through the Internet, so users lack the safety filters that schools do have installed. Apart from the technical difficulty the additional installation of filters would imply, it seems reasonable for children
to be granted full protection by the Primary Education Council within school buildings and remain under parental control when using their XOs elsewhere, in wireless conditions, MEC Centres or other telecentres and cyber cafés. Hundreds of people have already taken part in the XO courses for adults, but the impact has not yet been assessed. To begin with, it is clear that the invitation to workshops must be done formally, in close cooperation with the school. Parents who do not attend regular courses are naturally inclined to attend courses specifically oriented to XO laptops.

This apparent difficulty stresses the fact that the social fabric cannot be repaired through the actions of one single institution or project and that it requires joint efforts. The role of the Uruguayan state school in this task is clear and so is the need for other organisations, such as the Ministry of Education and Culture, to join in this endeavour in order to reach the whole education community.
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CHAPTER 11

Plan CEIBAL in Uruguay
What makes video games so irresistible?
Summary
When it comes to video games, it is notoriously difficult for young people to leave a game they have begun. What is going on? What causes this magnetic effect? This is the question we shall address in this paper, which continues the line of thought of previous studies and in which we shall analyse in greater depth nine key factors related to the strong attraction of video games: entertainment, immersion, loss of temporal references, the dissolution of self, exploratory enjoyment, the exercise of command and control, learning and valuation, cognitive challenges with opportunities to make decisions, the capacity to be emotionally contained by the machine, new ways of belonging to groups.
Introduction
Providing children with computers inevitably leads to their using them to play games. This is normal. It is only to be expected; they are children. However, adults note with concern how difficult it is for children and teenagers to tear themselves away from the screen and become involved in other activities. When it comes to video games, this is even more apparent and children find it exceedingly difficult to abandon a game which has already begun. “I'm coming,” “Wait a minute,” “Nearly done” are all phrases which tend to be used in answer to requests for them to leave their computers. What is going on, then? What is it they find so fascinating? Why are video games so irresistible? We shall address these questions in this paper, which continues the line of thought of previous studies in this field (Balaguer, 2002a, 2007b).

My position with regard to video games has always been to try to find the “middle ground”, to see their advantages and their disadvantages, to acknowledge them as genuine games (not as “less” of a game than others), to observe what aspects they help to develop, to understand why they are so enticing, what spaces and gaps they both fill and usurp, and help parents and teachers to handle these play opportunities in a proper and intelligent way.

It is perhaps because of this that I have generally had good results working with parents, when referring to games. Adults do not always understand what it is that makes these environments so fascinating and, therefore, in the face of ignorance, they often resort to censure. It is not unusual for video games to be considered, directly or indirectly, as second-rate games; games that are not entirely genuine from an adult perspective and above all,
It is not unusual for video games to be considered as second-rate games; games that are not entirely genuine from an adult perspective and above all, guilty of being the cause of isolation and cognitive and emotional deterioration in the young.

or developing intelligence, other than eye-hand coordination or perceptual skills. Lately, however, these views have been undergoing a slow but steady change, to the joy of young people, who are tired of being stigmatised and blamed for their choice of play activities.

images which appear on the screen are the main aspect the adult mind takes into account when evaluating video games, and what is often seen is violence, or bizarre and monstrous scenes which horrify adults. Generally, when games are evaluated in this way, the emphasis is on the most superficial aspects of the game; the scenic element, images which, as Prensky (2006) rightly pointed out, are “eye-candy” and not the true or most important causes or reasons for the strong attraction of video games. One of the basic aspects of onscreen play is what is known as the “suspension of disbelief”; that is, to ignore the elements that show that what appears on the screen is only fiction. This concept, derived from the arts, can perfectly well be applied to video games. A further issue to consider is the effect playing has on the “self” of the Who is onscreen. In this kind of game, a curious phenomenon emerges from the subjective point of view; there is a sort of “dissolution of self” which places the mind in a state different from its habitual and ordinary one. To continue analysing in greater depth a line of thought which appeared in a previous study (Balaguer, 2007b), we could point out that some of the elements that
make video games so fascinating, so enticing, are:
1. **Pleasure, entertainment.**

2. **Immersion in a different reality and loss of temporal references.**

3. **The dissolution of self and merging with the characters and settings.**

4. **Exploratory enjoyment.**

5. **The exercise of command and control.**

6. **Responses involving stimulation, optimal frustration, learning and valuation.**

7. **Cognitive challenges with opportunities to make decisions and test skills.**

8. **The capacity to be emotionally supported by the machine.**

9. **New ways of belonging to groups.**

**1. Pleasure, entertainment**
Without pleasure and entertainment, there is no onscreen game. “Fun” is always the answer when players are asked about the attraction of video games. They are games (nothing distinguishes the traditional definition of a game from what takes place on the screen) and, therefore, the notion of pleasure and entertainment must be present. Video games that are not entertaining will be discarded immediately, however good their graphics may be. The characters, the action envelop players in an atmosphere of fun, pleasure and a lot of magic. Video games make it possible to immerse oneself in a world with magical features, a fictional world in which acts can be carried out which are impossible in everyday life. Part of the fun consists in being able to do things that cannot usually be done in everyday life – this is the “what if” element of games – either because they are impossible, or because they are transgressive.
2. Immersion in a different reality and loss of temporal references

Another aspect of enjoyment is the presence of enveloping sensations that make players feel as if they had travelled to a different location and left their everyday world behind, thus disconnecting from material reality. This is what parents observe when they attempt unsuccessfully to attract their children’s attention. Through images, music and environmental feedback, video games make it possible to set the scene for fantasy on a digital stage, in which one of the main attractions is this immersion experience they offer. The surrounding world fades into the background and players enter a dimension in which the perception of the passage of time changes. This is a world without time or where time is fluid (Hupert, 2009). With virtual reality and the possibilities it provides – and even more promises – immersion will reach unimaginable dimensions, with even greater opportunities for the use of 3D bodies and spaces (Balaguer, 2005a).

Synthetic images bring closer, create and recreate worlds ridden with visuals and the concepts they are linked to, opening up all of the possibilities of simulation.

3. The dissolution of self and merging with the characters and settings

Entertainment and the entry into another world of fiction must be accompanied by a third issue: merging with the machine, and more specifically, with the character in question. In these games, subject and object intermingle giving rise to a strange combination of human and technology. This absorption, this loss of time and space references causes the mind to become “connected”, with a strong sense of being absorbed, “trapped” in a kind of fascinating experience. Part of the pleasure of playing video games is precisely that of entering into a mental state which is in synchrony with the machine and responding automatically, unconsciously, almost blending in with the machine and its rationale. Players
are often absorbed in the game, immersed in the screen to such an extent that they seem not to hear when spoken to, when they are required to return to the real world; this is so because video games need the for subjects to “place” themselves the screen, to leave their bodies temporarily and identify with the character or situation in order to be able to play appropriately and win. Video games usually involve characters which must be embodied by players, and to this end, the player-character-machine distance must almost disappear. “I am this character and this character is me,” would be the way to phrase this in phenomenological terms. There is a total identification with the character in question, whoever this may be. There is a process of merging, in which, for a player, “he and the character” are almost one. This is, in fact, to inhabit fiction: to completely lose sight of the distance separating player and character, even though there is, at the same time, be some
awareness that the player is not the character. There is something in the nature of discrimination which is preserved, making this a “what if” game, but which at the same time makes it necessary to achieve a temporary merging. The character in question does not represent the player; nor does the player represent the character. The player does not identify with the character (who maintains a distance between self and the other), with what happens to the other as in a children’s story; on the contrary, what happens to the other, happens to the player. This is what the dissolution of self we referred to above is all about. This is why players can experience so much anguish or frustration when they lose, or when something unusual or dramatic occurs to the character. This is seen in the case of life simulators such as SIMS, or in fighting games. We are referring to games where it is necessary to merge with the machine, with its powers, its character, etc. Video games enable an expansion of the functions of self and the player’s body, and an exchange of these functions with those of the character being taken over. This becomes a “self” with expanded abilities and cognitive possibilities, power, knowledge, etc. The character is not “in the player’s place”; it does not represent the player, it is the player. This is not a representation, but a simulation; players act like the character itself. The character will advance according to the skill and expertise of the player, but these skills are determined by the skills of the character in question. This is why disconnecting can be so painful; it implies a loss, a letting go of the character’s traits, breaking away from its features and returning to the player’s own – limited – self. Disconnecting leads to the emergence of the “hypobody” experience (Balaguer, 2002) which I have described in relation to the body and the difficulty of handling oneself in the face of the multi-presence of networks. The single, material, limited body is an experience which is felt as a restriction of that other body which had merged with the different powers of the characters in the game. Players find it difficult to disconnect from that world which is filled with fictional images and scenarios, since it implies leaving behind powers, strength and one or more bodies, which complemented their own. In young children, it is easy to observe this difficulty in breaking away from the screen and the ill-temper and irritation they experience when forced to do so. This irritation is, in part, due to having to emerge from this empathic state of fusion, of cadence and synchrony, which occurs with the onscreen character.
4. Exploratory enjoyment
Video games are, in my view, the toys which best embody a countless number of elements which are characteristic of our times and which we may perhaps only become aware of through these cultural productions. The colourful scenes of video games are a space to be explored and a metaphor of change and the capacity to adapt. Video games teach how to navigate the uncertainty of the screen, where exploration becomes necessary in order to achieve the final outcome. Subjects must take charge of situations, using elements and skills their characters possess, and make their way along paths plagued with uncertainties. It is there, on those screens, that the uncontrollable and unpredictable postmodern vicissitudes must become manageable for a subject who has only his own resources, his knowledge, no handbook. Many of the games depict an enigmatic situation to be revealed over the course of the game itself. You need to play to find out what happens. The end is not a given; it is unknown and must be found through exploration. In onscreen games, “reality” is gradually discovered as the game unfolds. In order to advance in the game, it is necessary to explore, to learn, experiment and discover ways of passing from one screen to another, to advance from one level to another and leave behind the various obstacles which appear.

Video games are the toys which best represent the era of knowledge we are now living in. Subjects are immersed in a world in which they must solve their difficulties autonomously, using the resources the character of the moment provides.
5. The exercise of command and control

Every game represents a new challenge to the player’s ability to get to the end or, in video game jargon, reach “game over”. Children use the characters, materials and scenery which the game provides, seeking to achieve success through their command of the game. Feelings of control, of achievement (Bandura, 1995) are essential factors in the game’s attraction and the magnetic pull we referred to before. Video games are characterised by their very strong and well-designed feedback capacity. They handle systems of rewards, praise and bonuses in the form of levels, which can be adapted to the levels of experience of players, in order to keep their attention and motivation focused and prevent a decline in concentration.

[Games] handle systems of rewards, praise and bonuses in the form of levels, which can be adapted to the levels of experience of players, in order to keep their attention and motivation focused and prevent a decline in concentration.

players are demotivated, nor so difficult that they become frustrated and give up. An excellent lesson for education: the learning spiral in games is enviable. They provide a constant challenge to self-esteem and the perceptual, strategic and response skills of players. However, every game can be adapted to the user and his/her current capacity. Games provide constant reinforcement, which is part of the bait they use to motivate players to keep playing. Video games allow the deployment of aggressiveness, as well as the satisfaction of displaying facets of the personality which are not
usually exhibited, or may even be the object of censure in daily life. Acts can be performed in this other reality which are not possible in “real” life, but which could become a good way of preparing for the future, as in the case of simulators (Balaguer, 2003a). To a large extent, command involves finding the appropriate procedures through the “kinaesthetic intelligence” which comes into play on the screen. This is not about thinking but about reacting (this is the key), or anticipating what is to about to happen. Thought and reflection have no place on the screen; the crucial factor is merging and using bodily procedures, to keep in touch with whatever befalls the character; there is usually no time to think. This is akin to what élite sportsmen or women, or musicians do when they are focused on their task: they simply deliver their performance. Being able to stay in this zone – known as the flow zone – is what makes the game fluid.
6. Responses involving stimulation, optimal frustration, learning and valuation
To add to the previous point, it is also important to stress the importance of being in the flow zone. The “acceptable difficulty” parameters – being neither not so easy that they lead to a lack of interest, nor so difficult that they produce frustration and desertion – call for a quality of support which is often overlooked. Television has been labelled a “digital nanny”, or “electronic dummy”, owing to its capacity to provide company and soothe; video games bring new elements into consideration. Keeping a player within the flow zone implies that the obstacles the game provides must always be in keeping with the player’s level of skill. Gradually, the challenge is increased; constant motivation is generated, as well as optimal frustration. This is another of the factors which makes this fictional world so attractive and so hard to abandon; it handles quite “optimum” level of frustration. Games frustrate, as a Winnicott’s (1995) “good-enough mother” would do. Therefore, these games provide a sufficiently good support, capable of reducing many anxieties, despite not being another person.

7. Cognitive challenges with opportunities to make decisions and test skills
In onscreen games, decisions must be made constantly. Video games provide infinite opportunities to develop skills in decision-making. In fact, many cutting-edge companies have focused on games when hiring staff. In graphic environments, information flows and the player must continually choose what road to take in order to reach the goal. Success depends on the decisions made. Each screen presents new problems and a variety of choices. Skills are constantly challenged, which makes it extremely difficult to abandon the game. With the exception of video games, young people have few opportunities to do such a vigorous excercise of decision-making.
challenged, which makes it extremely difficult to abandon the game. With the exception of video games, young people have few opportunities to do such a vigorous exercise of decision-making.

8. The capacity to be emotionally supported by the machine

In many of the cases of overuse or abuse of video games which I have seen, a significant element which has always been present has been that of escaping or avoiding the material world. In this respect, video games constitute a more stable and intelligent form of company than television, amongst other things because it enables a greater level of interactivity and the chance to reach others. On screen, children find a magical world which transcends the rules of the adult world. Problems must be solved, fears must be faced and players must try to emerge unscathed. We live in a world which is perceived to be hostile and parents want – and at the same time do not want – their children to go out into the street. The screen has become a good solution: it provides a way to go out without moving away from home. We also live in a forsaken world, a world not only of street children, but of screen children as well, whose only support is
often the digital world. These are children who have found in the screen an “electronic support” to make up for the absence and failings of their parents. These are children who learn to surf on their own, because their parents are digital immigrants; illiterates in a new digital culture. Now children do not only play in order to address their past conflicts or overcome their present difficulties, but also to learn how to handle themselves in a future world which awaits them on the screen.

9. New ways of belonging to groups
Finally, when they are managed proficiently, video games make it possible for players to join certain groups which provide not only a sense of belonging, but also pride in belonging, which strengthens self-esteem. Virtual scenarios offer places in which young people are acknowledged and where what they know is taken into consideration and valued by others. These are experiences they do not always encounter in the material, everyday world.
A psychologist who graduated from the University of the Republic of Uruguay (UdelaR), and holds a post-graduate degree from State University of Minnesota, MN (USA), he has been on the faculty of UdelaR and CLAEH.

He is a clinical and educational psychologist with over fifteen years of experience in educational institutions. Coordinator of Programa Link.spc, at St. Patrick’s College, Montevideo, Uruguay. He has participated in Plan CEIBAL training sessions and taught workshops and spoken at conferences in Uruguay, Mexico, Panama and Spain.

He is the author of over forty articles and has published the following books:

- Internet: un nuevo espacio psicosocial (Trilce, 2003)
- La Pantalla. Lugar de encuentro, juego y educación en el siglo XXI (Frontera Editorial, 2005)
- Plan Ceibal. Los ojos del mundo en el primer modelo OLPC a escala nacional (Prentice Hall, 2009).

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Towards safer and more responsible navigation
Sharing the Internet with the family and accompanying the child are key factors
Introduction
The use of the Internet is rapidly growing in our country; one of the reasons is Plan CEIBAL. According to the latest findings of the Grupo Radar (December 2008), one in every three households in the interior of the country has a Plan CEIBAL XO laptop, for one in five this computer is the only one in the house. The launching of Plan CEIBAL in Montevideo and Canelones during the course of this year (2009) will surely result in an even greater number of Internet users.

While this implies wider access to the possibilities offered by the Internet, it also entails some risks. In this context we believe it is important to disseminate information on steps that can be taken to improve the experience of surfing the Internet, with the aim of ensuring safer and more responsible navigation.
The risks
Crossing the road entails risks, great risks, which is why we teach our children how to do so. First we teach them not to cross the road without holding an adult’s hand; next, we teach them to look right and left before crossing on their own. But nobody would dream of forbidding a child to cross the road until he/she has finished primary school. This very simple action of stepping off the kerb and crossing the road to reach the opposite kerb is useful for children to socialise, get to know their neighbourhood and help their parents with errands. However, as it entails risks, it requires a learning process.

The same can be said of the Internet. Through the Internet, a child comes into contact with a new world, a universe of opportunities, many of them good, some of them bad. Children must be aware of what risks they run when surfing the Internet. Their parents and teachers must also be aware of this, since they belong to a generation that was born before the advent of the Internet and who, in addition, are frequently just as amazed by it as children are. In some cases they learn “to cross the road” together and that is good as it generates a friendly bond.

<table>
<thead>
<tr>
<th>Year</th>
<th>Internet users</th>
<th>Source</th>
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<tr>
<td>2005</td>
<td>680 000</td>
<td>International Telecommunication Union</td>
</tr>
<tr>
<td>2008</td>
<td>1 340 000</td>
<td>Grupo Radar</td>
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</tbody>
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International Telecommunication Union (ITU) www.itu.int
Grupo RADAR www.gruporadar.com.uy
between children and the adults who learn with them. In any search for information on the Internet, the most varied contents are only a click away from the user. The most innocent search for a word on Google may lead to a site containing questionable content such as pornography, racism, drugs, etc. Teachers and parents must deal with this. Content which is unsuitable for children is not exclusive to the Internet; it is also available on television, in magazines and the mass media in general. Yet the Internet does have two exclusive characteristics: its interactivity and the fact that information can be handled anonymously. We shall try to discuss briefly some steps on how to protect ourselves and the children and their families from risks in the use of the Internet. A great deal can be written about the subject but space is limited and we shall attempt to make good use of it in order to point out the most frequent risks and how to prevent them or deal with them.
...it is important for both teacher and parents to accompany children when they surf the Internet...

It is important to bear in mind that, as is frequently the case with innovations, they tend to be accompanied by faulty reasoning, exaggerations, etc. The best way to avoid this is by acquiring knowledge and education on the issue.

**Unsuitable content**

One of the most common problems is that children can come into contact with content that is inappropriate for their age. For example, sites that contain explicit sex, racism, drug consumption, child pornography, glorify anorexia, etc.

It is for this reason that school servers incorporate Internet content filters. However, no filter is perfect and, in addition, children can connect to the Internet once outside the school building, through networks that lack...
such safety filters. Furthermore, children can always visit a cyber café and find unsuitable material on the web; in our country, it is not mandatory, at present, for cyber cafés to install Internet content filters. For this reason, it is important for both teacher and parents to accompany children when they surf the Internet so they are not exposed to the world when on their own; adults should help make Internet surfing a learning or family-related experience rather than an activity carried out in isolation. It is important for teachers and parents to help children understand that not all Internet content is good, that they must evaluate the sites they visit on the basis of different criteria that parents and teachers need to address. If a child closes the computer screen quickly when parents or the teacher approaches, it should be taken as a useful warning and we must find out what’s going on and, very tactfully, try to talk it over with the child. In such circumstances, our support should increase and be based on mutual trust in order to reach a certain level of agreement. The most advisable strategy is to encourage children to tell us without any fear what they do when they surf the web, so that we can help them deal with the content they encounter.

A child who is the victim of any type of assault on the Internet should never be made to feel guilty...
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Contacts
Due to its inherent characteristics, the Internet is an ideal medium on which to establish contact anonymously and where people can assume different personalities. It is, therefore, important to tell children that on the Internet things may not be what they seem, and that they should be extremely cautious when contacting someone they do not know. They should be encouraged to chat in environments that include moderators. We need to explain to our children that they should never provide information about themselves or their parents to strangers. They must be encouraged to report to their parents any problems they encounter when surfing; whether they are insulted, shown unsuitable pictures or anything else they are exposed to and dislike. A child who is the victim of any type of assault on the Internet should never be made to feel guilty and, above all, we should never be angry when the child tells us about it.
Anger only diminishes their trust in us and they will cease to tell us about their problems. Such situations must, however, be reported to the school or the owner of the cyber café, so that necessary action can be taken, as there are ways of dealing with complaints. Parents must explain to their children that they should not always provide all of the information requested by Internet sites. What they should do before disclosing any information on a website is to consult their parents or teachers; in this way they can prevent unwanted e-mail and increase safety levels. Children must fully understand that they should never ever meet in person someone they have met online without telling their parents about it beforehand. If parents agree to such a meeting taking place, they should accompany the child, at least the first
time, in order to meet the person in question themselves (someone posing as a child could, in fact, be an adult). Some warning signals we should pay attention to are: children who become less communicative than usual, make efforts to delete files from their laptops before parents or teachers can see them, use their laptops at unusual times or change their normal behaviour patterns.

Internet fraud
The Internet, as an interactive communication medium, is fertile ground for all types of misuse and we need to be very careful when providing information online. A common scam on the Internet is to send out e-mails purporting to be from a bank, sometimes even including the bank logo in the message. A bank will never request information regarding credit cards, user keywords, bank account numbers, identification card numbers, etc., via e-mail.

Another fraudulent scheme is to send e-mails telling us that if we don’t send certain information, an account will be closed or a service interrupted. In that case, we should immediately get in touch with the company or financial entity that is, apparently, sending this e-mail. We should do this over the telephone or through a website that we are certain belongs to this organisation. Other unscrupulous operators send e-mails saying that you have won the lottery and that your banking data is needed in order to deposit the prize; this is yet another way to cheat us. As regards websites and banks that allow online transactions, it is recommended that parents request instructions from their bank as to how to make sure that the website on which the transactions are to be made, really corresponds to the bank in question. It is important to tell children never to provide information regarding their parents’ personal documents through the Internet, especially in the case of credit cards and identification cards.
question. The most important aspect when buying online is the safety level provided by the site or the company we are dealing with.

**Uploading content**

One feature of the Internet is that, unlike other communication media, we can all upload content. Children and parents must clearly understand that an image, video and/or text which has been uploaded and is circulating throughout the net, will always be available and will always continue to be disseminated. It has recently come to light that all over the world teenagers send images to their partners in private are then disclosed throughout the Internet by one of them, and this is just a matter of a few clicks. This situation may lead to problems and, in some countries, it is now considered a crime. One must explain to children how important it is to keep certain things private and the risks that are run when uploading images, text and/or videos or sending them via e-mail, as they are then no longer under one’s control. Adolescents may very quickly change their tastes in terms of the company they keep, the way they dress, the bands they listen to, etc., but once pictures, videos and/or texts are uploaded, they may find it difficult to get rid of the effects this may have on their image, and this is something they must be aware of.

For further information, the following websites can be consulted:

- www.asociacion-acpi.org
- www.protegeles.com
- www.laredytu.com
- www.portaldelmanor.es
The most important aspect when buying online is the safety level provided by the site or the company we are dealing with.

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Technology as a means to enhance education for children with special needs
The attention to diversity is a right, as is the fact that all children, regardless of their context, culture or even impediments, must have the same opportunities to obtain access to information and knowledge. We are all different, and perceiving this difference as a value and not a defect will enable us to avoid inequality and aspire to a fairer and more humane society with greater levels of solidarity and freedom. Considering diversity cannot therefore be limited to a declaration of intentions; Information and Communication Technology must be prevented from becoming a further element for marginalisation and discrimination in education.

The educational use of technology in order to cater to special needs makes it possible to provide all students with a genuine response which is more in keeping with today’s requirements and demands.
What are the effects on attention to diversity of the introduction of educational technology, hand-in-hand with Plan CEIBAL, in Special Education schools; schools which attempt to become a meeting place for people who have cognitive, gender and cultural differences?

The opportunities provided by computers are highly beneficial for all students, but above all for those with special educational needs, since they facilitate and foster communication, gaining access to and processing information, cognitive development (displaying, as A. Battro states, a new type of intelligence, “digital intelligence”), achieving all kinds of learning, motivation, adaptation and autonomy of the surroundings, pleasurable use of free time, self-discipline and the improvement of self-image and self-esteem.

This becomes particularly important in the training process of children, teenagers and young people with intellectual disabilities, who must face problems as regards work and in integration into society as responsible and committed citizens.
Special School Nº 108 – Minas

The arrival of Plan CEIBAL in our community implied the presence of:

- A determining factor in emotional development, since it reinforced the self-esteem and personal responsibility of children and families, improving teacher-student, teacher-family and student-family links.
- A tool which triggered meaningful learning in every home.
- A means to foster permanent teacher coordination (inspector, headteacher, teachers), made evident in a process of cooperative technical-educational learning.

Our students with special abilities are not only explorers in the classroom, but also in their homes. They share what they learn with parents and siblings, strengthening the school-home link, making it possible for families to gain access to opportunities for change and to new technologies which can thus be available to all, providing broader perspectives and tending towards greater social equity.

Our objective is to strengthen Digital Literacy through the use of ICTs. Plan CEIBAL, as a socio-educational plan, often reaches socially vulnerable contexts. Students learn to be citizens of the world, to open a small window to the world, the world of information, a world to which they had no access and which dignifies our objective and the role of our institution, since it gives us the opportunity to reduce an educational gap, which is the focal point of our target. We are marching towards the door to the future.
Working with XOs is a motivating process of permanent and cooperative learning, both for parents and students and for teachers. It implies a process of reflection – individual and collective – on teaching methodology and educational proposals. In this respect, the teacher’s role has acquired a new dimension and become even more central. Planning and guiding teachers in the use of new technology is considered to be essential, as is the permanent search for ways to incorporate this new tool into every educational proposal, into teaching content and educational objectives.
Plan CEIBAL in Uruguay

Special School Nº 103 – Florida
A plan to provide occupational qualifications is being implemented through a Repairs and Maintenance Workshop, in which the use of XOs is a prime resource, an attempt to move towards new forms of teaching and learning, towards different and diverging educational practice. As part of the Institution Centre Project, the Maintenance Workshop has established two courses of action in its curriculum.

One of these courses aims at the development of the necessary skills in order to be able to perform in social, cultural and labour contexts. In addition, work is carried out to develop labour skills, enabling students to enter a healthy work environment, either in school, at home or in the community.

Thus, the Repairs and Maintenance Workshop fulfils a curriculum which is characterized by being flexible, adaptable and continually revised, based on procedures, concepts and attitudes. There is a growing emphasis on processes and on transferable skills development, recognising the importance of social interaction and the development of communication skills.

The purpose is to develop a proposal which will prepare students for adult life in social, cultural and work areas; training for work with a high learning component, as well as responsibility and autonomy, according to a model in which flexibility and multi-skilling are the distinctive features.

In this context, the incorporation of XOs has become one of the essential tools in implementing teacher intervention appropriate for the individual who learns and the teaching approach. Working with XOs makes it possible, in the workshop, to introduce an integrated knowledge of how to do things, how to be and how to be with others, promoting appropriate performance within a given context. It has therefore become a versatile tool which enables students to perform individual and collective tasks,
Its use makes the interpretation of different codes (written language, iconic language) possible; promotes the presentation of ideas in the development of tasks in order to organise sequences; enables the verbalisation of actions and processes brought into play during the execution of tasks (by means of the video and photograph programme); generates documents and productions in which functional maps are recorded (expressing elements and units of competency, sub-functions and functions).

Thus, an idea of structure is created, where students search for information which may be within their reach in different network supporting areas, and can carry out the necessary actions to recover this information when the moment and circumstances should require it (a process similar to that which they must perform in order to recover information incorporated into their cognitive structure).

In an institutional context, in which the use of technology is geared towards the achievement of significant learning and the development of new forms of learning, the Repairs and Maintenance Workshop considered that it was essential for all students to acquire, in addition to the skills and with the rest of the XO’s auxiliary tools. Taking training and information with regard to specific teaching into consideration, it was seen necessary to create a Repairs and Maintenance Workshop blog, on which students could carry out tasks.

In this respect, a blog is a powerful tool with which to connect families to the work students carry out at school.

and abilities related to technical knowledge, the capacity to handle and control a computer in the first place, before placing it at the service of the workshop’s specific training. Students first became familiar with the Internet and its possibilities, with e-mail look for information (visit sites with content specifically related to the workshop, and general interest sites related to the world of culture, as well as entertainment) and, above all, share with those around them (school, family and community as a whole).
their processes, achievements and acquisitions.
In this respect, a blog is a powerful tool with which to connect families to the work students carry out at school. From their practical experience, students produce and record information related to the activities they perform in different training areas: construction, plumbing, furniture maintenance and recycling, glasswork, electricity, and ironwork. This work, which involves recording the steps students carry out when learning a procedure, is shared with the teacher, who monitors the production process, so that results can be made available to a wider community within the blog. Information is stored at different stages of the students’ tasks, so that all of the process becomes visible and students can gain access to it in a general way, or at specific stages of the procedure. This implies making a process which transcends the school setting and can be applied in other contexts (particularly in the home) comprehensible and transferable. At the same time, the opportunity of sharing with others makes student-workers protagonists their own activities, strengthening self-esteem through the recognition of their possibilities, and making their achievements visible. In this way, teachers can involve all of the students, working on common objectives, respecting their learning paces, heeding their different cognitive styles in a highly collaborative working environment (the possibility of working interconnectedly in a Mesh network).

**In institutional terms**, the transition towards a school that thinks differently and ventures to change must be addressed. This has implied working along certain lines of action which foster debate and discussion, in addition to teacher training, in order to give the tools their right place with regard to institutional objectives and in keeping with the values that underlie the concept of attention to diversity. The school must be organised from the perspective of a **school for all**, an area of opportunities in which each can find his/her place, in compliance with the current educational policies which form the basis of **Plan CEIBAL**. The process of raising awareness...
of the fact that computers open a new line of communication with children’s homes must be guided and conducted. In functional terms, it has meant leading the institution towards the production of teaching proposals which are as participatory as possible in their dynamics, which include the possibilities computers offer to 

**diversify and adapt the curriculum,**

in an environment of **collaborative** and cooperative work, making institutional frameworks more flexible in order to offer students greater opportunities.

**Special School Nº 116 for the Deaf – Salto**

To state that human beings are people who learn and people who teach; people who express themselves and communicate with others, with themselves and with the world around them, leads us to reflect upon the characteristics of communication at the time we are living. Basically, with the commitment to offer possibilities and turn our children into people who are capable of performing, of developing and becoming involved with the world through the new information and communication technologies. With regard to the use of XOs within the framework of the Plan for inclusion and access to the information society, digital inclusion is being achieved. The principal purpose is to guarantee their innovative use, integrated into classroom routines, offering technological support systems, the formation of learning units and the promotion of family and social participation.
In connection with this aspect, technology is being introduced into the classroom and into homes, thus promoting the democratisation of access to information and equality of opportunities for all of the children in the country. Video: students recording a story to share at home. Activity: record a story on the XOs, with the students. Objectives:

- To promote intergenerational learning that can take place between children and adults.
- Foster the school-family relationship.
- Develop the necessary capabilities for the 21st century society, in an attempt to close the existing digital divide.

In our specific case, with regard to the education of deaf children and teenagers, the incorporation of XOs into classrooms and families has made it easier for us to develop our institutional project, which involves bilingualism, by applying the new technologies.

Institutional Project on “Reading and Writing for Deaf Children”

General objective
To improve levels of reading comprehension and the quality of writing produced by deaf students who attend the school.

Activities
Video films are recorded in order to produce a USL-USL (Uruguayan Sign Language) dictionary in a unified format, for the whole country. The bilingual education of the deaf..."
has encountered serious difficulties in including the teaching of sign language and the culture of the deaf in the school curriculum, in view of the fact that there are no texts in USL which would enable working towards that aim evident. This year, linguist Leonardo Peluso has joined in our school work and attends weekly. We have continued to work on the areas which we had already worked on with him and with linguist Juan Andrés Larrinaga last year, with the support of some of the school project guidelines with regard to the teaching of writing and the teaching of Spanish as a second language. The basic and new ideas we are working on this year, which had already been proposed in the institutional project, are related to “Literacy in USL”; that is, the attempt to generate discursive and technological devices which will make it possible to record texts in that language in order to construct and work with them as if they were written.
The steps we have taken this year towards literacy by means of video recordings in USL are:

a) To bring students into contact with USL video recordings (use of XOs) in order to familiarise them with the technology, with regard to both recording and reading what is recorded by others. In this way, they face the need to build a text which can be understood by others who are not present at the time, and the need to understand a text at which was produced at a different time, and where they lack any chance of exchange with their interlocutors (similar to what takes place in written Spanish). The family is also involved, as students have the possibility of taking their videotaped texts home; which is comparable to taking a storybook home.

b) USL literacy for the whole of the school’s teaching staff: primary and secondary school teachers, linguists, and clerical staff. This implies seeking discursive and technological resources which are in keeping with this line of work:

1. We have attempted to perfect the handling of XOs with regard to reading and comprehension programmes, along the lines described above.
2. All kinds of videotapes are being produced (involving a wide range of genres), in order to begin building a video library.
3. Both the deaf and non-deaf will take a course on videotape edition to learn how to edit films based on USL videotapes; a similar process to using a pencil to write with in Spanish.

In addition, and in the understanding that this new form of literacy must go hand-in-hand with the solid development of an oral USL metalanguage, we are working together with the linguist and the school’s deaf teachers in order to generate higher levels of reflection regarding USL, also including students and non-deaf teachers. At the same time, both deaf and non-deaf teachers are beginning to use this knowledge in the classroom. This implies:

- The syntactical analysis of USL sentences, using XOs.
- Morphological analysis of signs. The concept of “parameter” is worked upon in depth, together with the different parameters which make up a sign. The configuration and movement parameters are being studied more intensively at present.
- On the basis of this, strategies have begun to emerge for the use of USL-Spanish dictionaries, in the understanding that parametric knowledge is required in order to use them. Thus, the use of dictionaries becomes an indispensable tool when making metalinguistic reflections regarding language.

These are the effects of this work on the school population:

- We have incorporated new strategies and technology in the teaching of language and literacy, within the
Within this literacy proposal, the XO camera and keyboard operate for the deaf as copybooks and pencils do for non-deaf...

framework of the bilingualism which implies handling USL differently. For example, together with the alphabet hanging on the classroom wall, there is also a picture of the different parameters of USL, which contributes to generating a literate environment in the classroom.

- Students are particularly interested in the use of videotapes and the USL-Spanish dictionary. They appear to be accessible and stimulating technologies for them.
- Students who rarely participated are now enthusiastic when the task of finding and taping all of the signs with a specific configuration is proposed.

In the context of USL literacy, the significant role of the XOs should be stressed; they have allowed us to find
ways to enable the reproduction of videotapes and recordings. Within this literacy proposal, the XO camera and keyboard operate for the deaf as copybooks and pencils do for non-deaf in their literacy process. For the time being, XOs allow us to record, and to reproduce recordings. One of the ways of intensifying the literacy process will involve learning videotape editing techniques, as this will make it possible to effect changes on recorded texts, thus allowing new “writing” operations on texts.

Special School for the Hearing Impaired Nº 84 – Maldonado

The presence of technology in the classrooms of School Nº 84 of Maldonado is very positive. XOs are a powerful teaching tool which, unlike other tools (copybook, blackboard, etc.) transcends the educational environment, since it is incorporated into children’s social life.

For teachers, the teaching of reading and writing, as well as other areas of knowledge find invaluable support in technology.

We work with the text processing program, with which editing text is an attractive task; students add images, photographs or drawings they have made themselves, which they learned to do very quickly and well.

Etoys has proved to be an ally when teaching writing. Comic strips have been produced by means of several different activities. Chat sessions constitute valuable material; on the basis of mistakes and questions, we try to improve writing.

The opportunity to film within the classroom is essential. Somehow, filming a dialogue, or a story in USL works like writing (we must remember that USL is agraphic), allowing us to analyse different grammatical, syntactic and semantic elements of discourse, and see them again and again.

Students tape riddles, dramatizations and other activities, which their families can later watch.

The opportunity of connecting to the Internet is very valuable, since it leads
to the need to learn how to use it. The need to know written Spanish and, at the same time, surf the Internet is a source of information – encyclopaedias, websites, portals and so on appear, as do other forms of communication: chat rooms, e-mails, blogs, etc.

Children become more collaborative, they interact with more solidarity, generally seeking solutions to problems. They become socially stronger.

They use their laptops like a “vast picture dictionary”; when they are uncertain or do not know the meaning of a word, they use the image search feature on the Internet and immediately have access to answers. For example, on one occasion, three children began to discuss the meaning of the word “dove” (paloma in Spanish) and how to write it. When they entered the word into the image seeker, pictures and photographs of doves appeared, as well as of women. They confirmed that the word depicted a kind of bird and wondered why pictures of women appeared; it was then explained to them that in Spanish, paloma can also be a girl’s name. Many similar situations come up, providing opportunities for children to learn to read and write smoothly.

Amongst the activities provided by XOs, there are many which stimulate the development of logical thinking and of something which is very important for the deaf: vision.

The Sugar graphic environment has proved to be very accessible to deaf children, since it shows few words, many icons and is easy to handle. The children have learned to download activities and games. Teachers can introduce educational games found on the Internet, as part of the teaching-learning process of any content. We teachers agree that we are only at the initial stages with regard to incorporating XOs into our educational practices. Our school has welcomed this new technological tool, considering it to be a valuable instrument, capable of being incorporated into our daily tasks. It is a small contribution which enables us to shorten the huge digital divide and advance along our chosen path, seeking the realisation of the potential of each of the children in our schools.

«When it is genuine, when it is born of the need to speak, no one can stop the human voice. When denied a mouth, it speaks with the hands or the eyes, or the pores, or anyway it can. Because every single one of us has something to say to the others, something that deserves to be celebrated or forgiven by others.» (E. Galeano, 1989)
Special School Nº 200 for the Motor Disabled “Dr. Ricardo Caritat” – Montevideo

Socio-emotional problems: hyperactivity, lack of support for learning, lack of social awareness, distraction, motivation

With regard to socio-emotional levels, it has been observed that the use of XOs motivates children to the point of diminishing hyperactivity, as well as levels of anxiety and distraction. School Nº 200 for the Motor Disabled caters to students in the integrated modality; they attend neighbourhood schools in the area of regular education. The classroom teacher monitors the children’s learning, in coordination with the regular classroom teacher.

XOs constitute a tool which supports their learning. Students feel increased self-esteem and are capable of relating and interacting in the classroom on equal terms with their peers in the regular schools. They are seen to have acquired more self-confidence and be eager to teach and show the others their progress and experiences. They look happier and better able to follow the pace of classroom work; which used to be hard for them.

Cognitive problems: memory, problem-solving, metacognition, cognitive problems, brief attention span

We consider that the use of XOs benefits the resolution of cognitive problems, since children with motor disabilities do not need to make special efforts to write on them and thus, fatigue is lessened. This gives them more energy for other tasks. There is a programme which helps improve their memory, their attention span and their perceptual skills through play. Children are aware of their difficulties and that they can do everything more quickly with the XOs.

It was also observed that when there was a change of activity, from using XOs to using copybooks, there was no negative effect; on the contrary,
Education in human rights, the state school, the culture of diversity, education for a better quality of life; these should all be part of a single discourse which introduces us into a new world of values, in which people are respected for that very reason, for being people, and not for the place they occupy in society or for the level of production they contribute.

switching from one activity to another was well accepted.

Education in human rights, the state school, the culture of diversity, education for a better quality of life; these should all be part of a single discourse which introduces us into a new world of values, in which people are respected for that very reason, for being people, and not for the place they occupy in society or for the level of production they contribute.

The true challenge is not only the discovery of the new scenarios which are installing themselves in our schools since the incorporation of Plan CEIBAL, but adopting a **new viewpoint in order to understand these scenarios**. If the challenge exceeds our capacity, we should increase our capacity in order to reduce the challenge. In short, we must **begin to act today**, in order to build tomorrow.

**References**

Evaluating and consolidating experiences
Information and Communication Technologies (ICTs) and digital communication networks today occupy a central position in the flow of information, experience and capital between people. In this context, having access to technology and knowing how to use it (how to generate contacts and interpersonal links, communicate, interact, search and produce information) are fundamental conditions to become active members of society.

The differences between people – in terms of their opportunities to access and use ICTs – are known as “the digital divide”; this gap reveals the social, economic and cultural divide between those who have and those who do not have opportunities to join this new cultural experience.

From the onset of this decade, the conceptualization of “digital divide” has focused on discussions about the access to or the lack of access to technology. Despite being a fundamental aspect, this point of
departure has somehow constrained the understanding of the ICT phenomenon in today’s culture. On the basis of having or not having, the understanding of the digital divide seems to be structured, at times, as a series of dichotomies and clashes between being connected or disconnected; knowing or not knowing how to use ICTs; even including generational opposites like the one formulated by Nicholas Negroponte (1995): “Being Digital” or being analogue. This representation of reality shows a fragmented scenario between those who access, know how to operate and are connected, and those who – apparently – have no participation whatsoever in today’s digital culture and live outside the boundaries of this experience. According to Castells (2000), the “new technological paradigm” based on information technologies implies risks regarding the simplification of certain knowledge society-related phenomena. These simplifications may limit understanding and, ultimately, the possibilities of managing and transforming reality. In the field of education, in particular, authors like D. Buckingham (2008) have drawn our attention to an initial perception – since the mid-nineties – of boundless enthusiasm with reference to the potential impact of ICTs on education, anticipating radical changes in terms of student-teacher relationships and their individual roles in the learning process. At times, this perception seemed to pay little heed to
the complexity of ongoing cultural changes, interpreted as processes where fundamental transformations are produced in the cultural constructions that the new media grant to individuals; changes in terms of how people represent the reality they live in, how they understand different phenomena and what expectations – what desires – result from this understanding.

The most drastic changes in contemporary culture, permeated by ICTs, occur in the continuity, differences and inequalities of a person’s experience – argues Buckingham (2008:106) – while he draws our attention to “a new digital divide” which is more specific in terms of experience, and which we should be wary of: the gap between what children and young people do with technology on a daily basis outside the school and what they do inside the classroom.

...fundamental transformations are produced in the cultural constructions that the new media grant to individuals...

**Uruguay**

In the last decade (2000), the trend in our country shifted towards a universal use of computers and the Internet, not just in terms of access to computers but also in terms of their incorporation into different tasks. Recent studies reveal that among Uruguayans, average use of the Internet rose from 3.2 to 6.8 hours a week between 2003 and 2005; and that in subsequent years total figures have increased due to expansion – the incorporation of new users: more people now have access (for the first time) to computers and the Internet (Grupo Radar, 2003-2008). In this context, the technological experience of most children and young people, in particular, has usually taken place in the private sphere due to the continuing expansion of personal service devices – such as cell phones and Internet connections at home – and for the less privileged sectors, in particular, through the so-called cyber cafés (Pittaluga y Sienra, 2007:15).

In 2007, Uruguay launched a nationwide initiative granting state school students and teachers laptops and Internet connection in schools. This measure, called the Plan CEIBAL, initially aimed at primary education and including middle school as from this year, is framed within a national development policy based
on scientific and technological innovation.

The particular way in which Plan CEIBAL was implemented, through the education system (and, more specifically, through primary state schools), has had a direct impact on the digital divide that separated the digital experience in formal education from other learning experiences – other instances – that took place beyond the scope of the school.

As illustrated by the following bar chart, something simple but significant started to change between 2006 and 2008: the place where children's experience with ICTs takes place.

Over the course of two years (2008 – 2009), Plan CEIBAL has been able to modify a scenario so far dominated by the local private sector and has provided new digital experience opportunities in schools.

According to data compiled by ANEP, in 2007, the number of state schools throughout the country, with “ten
or more” computers for educational use did not exceed 6%; by late 2008 (half-way through the implementation of CEIBAL) they exceeded 55%. Of the schools that still had no CEIBAL by 2008, only 21% used computers weekly for educational purposes; while 89% of the schools that received Plan CEIBAL laptops that year were able to use computers weekly for educational purposes (ANEP, 2009)\(^1\). Likewise, the implementation of Plan CEIBAL through schools – though not limited to schools as the only space for learning (the laptop travels to different places using and producing meaningful content: homes, schools, communities) – allows us to envisage technological progress as an all-embracing phenomenon in a society’s experience, and the task of education as a responsibility that transcends the school walls.

### Discovering the network

In our country, the incorporation of ICTs into education is not a novelty. Different official programmes have been moving in that direction since the mid nineties. However, given the insufficient level of development in terms of possibilities of access, the educational use of computers in schools (with children) mostly focused on adult learners: for the search and preparation of class material or in the elaboration of reports (ANEP, 2008:155). The use of IT resources as a learning experience for children has historically been peripheral in our schools. Experiences have mostly been on an individual level – mainly of teachers – providing a likely improvement in their delivery to the group (in the presentation of information), but ultimately repeating

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**Primary state school children aged 8 to 11. Use of PC & Internet over the last 6 months, according to place of access 2006/2008 (%)**

<table>
<thead>
<tr>
<th></th>
<th>Cyber café</th>
<th>School</th>
<th>Home</th>
<th>Cyber café</th>
<th>School</th>
<th>Home</th>
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</thead>
<tbody>
<tr>
<td><strong>Montevideo</strong></td>
<td>70</td>
<td>19</td>
<td>22</td>
<td>56</td>
<td>25</td>
<td>29</td>
</tr>
<tr>
<td><strong>Interior</strong></td>
<td>65</td>
<td>32</td>
<td>19</td>
<td>67</td>
<td>29</td>
<td>33</td>
</tr>
</tbody>
</table>

(Children who have accessed the Internet at least once in the last 6 months)

Compiled by the Plan CEIBAL Evaluation Area, Assistant Ignacio Salamano, on the basis of microdata from ENHA 2006 – ECH 2008, National Statistics Institute of Uruguay.
a traditional teaching practice where some (the adults) more than others, are responsible for searching, validating and delivering knowledge.

In this regard, one of the first noticeable changes after the introduction of the 1:1 modality laptops for children was the proliferation of interests and different ways of using technology in relation to information, both by students and by teachers.

As the precedent had been an individualised scenario where the experience of ICT-based learning was in itself difficult to share, the first trend we noticed in the new scenario was precisely the intensive use of interconnection between computers, the Mesh network and Internet access. Connectivity is the attraction par excellence during this first stage of CEIBAL for both children and adults: access to communication via the network – to be part of the network themselves – and obtain access to the universe of network content.

In this search for and downloading of contents, interactions and innovative ways of connecting with peers and “the others” are devised with and through the computer. Given that each actor has a chance of working with one computer, each user has personal time available to get used to the medium, find personal interests and then – on the basis of this previous personal exploration – generate interaction, communicate with others and share information. Technical solutions regarding the use of technology are also exchanged, tactics are socialised to optimise the resource and – most importantly – interests (findings) are shared on the web.

Knowing how

The use of the Internet, in particular, implies certain skills that are linked mostly to the search for and validation of information. At the end of the first year of massive implementation of Plan CEIBAL in the interior of Uruguay (2008), an evaluation pilot study explored the first signs of appropriation of the experience by children, teachers and families.

In schools where CEIBAL had been implemented for longer, activities using the XO laptops in the classroom were proposed, in order to explore ICT styles and competence related to information management and... something simple but significant started to change between 2006 and 2008: the place where children’s experience with ICTs takes place.
interpersonal communication. The first task directed at children sought to determine to what extent they could search for specific information, validate their findings and reflect on the process itself. We were able to verify that in 3rd and 4th grades (ages 8 and 9), 53% of the students could respond to the assignment accurately: find a specific type of information, in a specific medium; while the percentage rose to 71% in higher levels, 5th and 6th grades for the same assignment. This experience also allowed us to confirm the high level of motivation of these children, not only in terms of carrying out the task but also by showing what they could do and justifying the steps taken from the initial search to the final selection of material. The second assignment involved using a chat session (via the Mesh network) connecting different XO applications to engage in a conversation with a classmate; this was no longer about searching for information but using
the computer as a personal means of communication\(^5\).
In this case, the environment suggested in the CEIBAL computers (Mesh network + Vecindario\(^6\)) provided a virtual setup that was particularly useful for the self-representation of the XO user in a virtual space, and to perform tasks with other users. Here, the first aspect to be highlighted was how familiar children were with this medium; over 80% of them were able to locate, contact and carry out a conversation with a classmate when required to do so. A further surprising aspect was the very slight difference as regards capacity to comply with this assignment between children of different ages and in different grades: 83% of children in 3\(^{rd}\) and 4\(^{th}\) grades and 87% of children in 5\(^{th}\) and 6\(^{th}\) grades were able to achieve this. Chat activities elicit the spontaneous participation of children; they refer to it as something they normally do and this allows them to communicate in a more personal way (they appreciate this privacy) with their classmates, and also with others outside the classroom, in the neighbourhood of the school. Chatting, together with cell phone text messaging (or SMS) are very agile means of communication and are very much favoured by children over other digital communication options, such

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as for example, e-mail. The possibility of being online – immediate, virtual contact – with others is very popular with children.

**Learning with ICTs**

Expectations regarding Plan CEIBAL have been voiced in different ways from the very beginning of its implementation; at times they were presented as extrapolations or clashes between pedagogical models that are subsequently difficult to consolidate as a single alternative. In any case, the phenomena and cultural processes resulting from this innovation are more about integrating and strengthening what we do and learn than about confrontations or the simple imposition of elements that differ from existing structures.

In the intermediate school grades, 3rd and 4th, despite the apparent autonomy of students in managing the network, search for information is mostly guided by the teacher. The typical dynamics of a classroom tend to include collective navigation towards a predetermined destination (the web) and, once the whole group has arrived, the information-processing task (validation, organisation and reutilization) takes place. These practices frequently share traditional methods – such as drafting summaries and transcribing text – with new opportunities for autonomy when searching for information, expanding the learning object’s reference and specification model and being able to act upon the information itself.

In higher grades, 5th and 6th, the More classroom interaction is also observed at this level – they constantly move from one place to another, from one laptop to another to exchange solutions for basic software management, key terms, access, directions within a given site, file downloading procedures, and information recovery.
mediation of teachers tends to be more flexible, in view of the children's experience. They are more self-reliant and autonomous to use the Internet, when they are working with well-defined issues. Modifications and increasing complexity in search terms, discussion of results and adjustments take place. More classroom interaction is also observed at this level – they constantly move from one place to another, from one laptop to another to exchange solutions for basic software management, key terms, access and directions within a given site, file downloading procedures, and information recovery. The role of teachers in the classroom, in turn, is also being readjusted, as a consequence of the possibilities for autonomy that children have in their learning process.

Beyond the development of the basic computer skills, which mostly occurs intuitively by trial and error on the part of children, the more complex types of development – those that
allow for the use of computers for different purposes – require the teacher’s support to stimulate students’ reflection on knowledge as a process and an outcome. Consequently, as we reconsider the teacher’s role objectively and subjectively, and the teacher starts acting as a learning promoter, encouraging experimentation by using the different resources available – computers amongst others – students will respond with a higher degree of technology appropriation, and this is reflected in the way computers are used, how much students derive from their laptops, how they look after them and even how they are personalised. Teachers’ intervention plays a leading role in the development of this experience not only in terms of the concrete school practice – customising the experience to children’s different ages, needs and interests – but also in terms of providing these practices with a new meaning.

**Evaluating and consolidating experiences**

In addition to the progress made so far in terms of providing access, promoting the use of laptops and integrating this new possibility into the experience of children, families and teachers, CEIBAL is an ongoing policy that seeks to consolidate its implementation and fully promote the experience with new technologies in the digital society. Today, the technological (digital) experience, as part of formal learning, appears to be a “different,” “new” and unavoidable area of knowledge, yet we do not know exactly what to make of it. This uncertainty may cause some anxiety in those with a direct responsibility for education; however, there is an overall consensus on the need to continue along this road. Moreover, the world of ICTs is dynamic, the supply of equipment and utilities is growing constantly and it is necessary to reformulate scenarios and make new decisions.

In this regard, the evaluation of Plan CEIBAL as a cultural policy is an indispensable resource to make decisions regarding the ongoing process, its difficulties and potential...

...the evaluation of Plan CEIBAL as a cultural policy is an indispensable resource to make decisions regarding the ongoing process, its difficulties and potential, and its ability to meet the expected objectives. The conclusion of a first stage of implementation of Plan CEIBAL in 2009, has allowed the direct evaluation of the experience to begin. An interdisciplinary team of professionals in the area of social science and pedagogy is currently working on the design and application of evaluation instruments that will enable the compilation and description of the experience gathered during this first year of Plan CEIBAL. In June, a nationwide survey was conducted with a sample of 200
schools; children, teachers, principals and families were interviewed and through systematic observation the ways in which children use technologies were recorded. Simultaneously, a number of schools in different regions of the country were selected to collect insight in the experiences of each actor involved in CEIBAL. Once the computers arrive and are incorporated into the daily routine of children, teachers and families, evaluation seeks to determine first the conditions for access, preservation, use and application of computers and the Internet. In addition, an attempt is made to discover how those people involved perceive the proposal, as well as the possibilities and challenges facing each of them. All of these aspects will be observed and evaluated throughout the entire process. This experience has posed many questions: what is the digital experience all about? What does it enable? Is it useful for the school? Is it useful for the family? What changes take place at
individual and collective levels? Will the way we communicate change? What identity constructions may result from this plunge into the digital world? To what extent can this insertion constrain our links with knowledge, with science, the arts and even social relations? Uruguay has begun to travel the only road that allows us to answer these questions more thoroughly: the road of experience. The diversity of questions that accompany the process ultimately bring us back to the original or fundamental uncertainty – or perhaps, curiosity: what will our future be like?
References


1 Produced by the Evaluation Area of Plan CEIBAL, Assistant Ignacio Salamano, based on the Education Monitor, Primary Education 2008.
2 The Mesh network is an XO resource which allows laptops to connect to one another without having to connect to the Internet; they can create an XO-users Intranet and share the use of applications and the creation of documents.
3 The pilot evaluation study was carried out in December 2008 and involved 44 schools. There was a questionnaire (survey) for teachers, children and families covering different aspects; in addition, there was an activity on the use of XOs geared to children in 3rd and 6th grades (in 22 schools).
4 Assignment I for children in 3rd to 6th grades: To search for information on the Internet: “Media news on health”; “School blogs”; “Encyclopaedia information on wind energy”; focusing on the specific type of information required and the medium that provided it.
5 Assignment II for children in 3rd to 6th grades: To find a friend in their virtual “neighbourhood”, contact him/her, suggest a topic and carry on a conversation with him/her.
6 “Vecindario” (Neighbourhood) is a screen visualization that allows all children, on their own computers, to recognize their classmates and other users connected at the same time and initiate contact with them.
7 Apart from the different elements – stickers, ribbons, bags, keyboard protectors, etc. – which boys and girls use to identify their computers, we also observe a more complex personalization in terms of the use of this equipment, the incorporation of software (downloading programs) and additional hardware (peripherals), that respond to their individual preferences and taste.
8 On an educational level, ANEP permanently produces information on the performance of the system at the primary and secondary levels, including general information on the progressive incorporation of ICTs into education. In addition, LATU – in the Technical and Logistics areas of Plan CEIBAL – performs follow-up on the distribution of laptops and connectivity, while it also monitors their use through school servers.
CHAPTER 15

In the words of the actors and the education community
At the outset of this article, which is an attempt to gather opinions with regard to Plan CEIBAL, in the words of its leading figures, we refer to a conversation between Paulo Freire and a group of rural workers.

“Forgive us, sir,” said one of them, “for speaking up. It is you who should speak because you are the one who knows. Not us.” (P. Freire, 1993:65)

If this conversation were to occur today in our country, in connection with the incorporation of ceibalitas in schools and families, its participants would surely be more confident, and convey the conviction that they have much to share in terms of experience, beliefs and knowledge.

“What most impressed me was seeing the closeness between children and their mothers, sitting by the ditch.”

This was the impression of Ema; a great-aunt who went with the second-year group of School No. 286 to an encounter between XOs, families and the school, at the CEIBAL Fair of Las Piedras.
She was equally enthusiastic about the weekly workshops that Jacqueline, the class teacher, carries out with the participation of parents and children, as a form of familiarising them with the different activities made possible by the XOs. This intervention strategy allows teachers to gain control of the complex aspects of the activities and allows parents to help their children with their work. Ema stated: «More and more parents are taking part!»

Why not undertake a further challenge?

We suggested to the teacher and the mothers who were present that they should film one of those workshops for the CEIBAL Channel and they did not hesitate to answer that they liked the idea and added that other parents would certainly feel the same way. In this way, the voice and activities of children, teachers and the community expand and reach others who are also in the process of thinking and building upon this “technological immersion” context from which nobody emerges unaffected.

What do the children say?

When we come into contact with the schools and interaction with children begins, their voices become noticeably louder, particularly when the subject is about XOs and digital aspects in general. Noelia: «I like this platform because we work, we upload things the teacher tells us to do on the computer and then we have to upload them, and also, sometimes we can chat with the whole class and we do the work with the mothers. It’s cool!» Guadalupe: «I always use it to study, but... »
Plan CEIBAL in Uruguay

One of the things I like best is sending messages to my uncle in Russia and to my aunt in Italy; oh, yes, and I lend it to my aunt who goes to high school. My XO never stops!

Braian: «At home I share my machine with Mum, who is taking a course at the MEC centre and I helped her to enter for an OSE draw.»

There is a noticeable change in focus regarding power relationships in the classroom, the links with information and the production of knowledge, which affects the school’s micro-politics. This certainly leads to rumours, alliances, agreements, resistance, conflict and, above all, challenges, growth and innovation. Children interact with their teacher, parents, a foreign visitor or with each other, with a great deal of confidence, displaying a variety of communicational resources.

What children say and do with technology today, will be reflected in their families, the community and the Uruguayan society of tomorrow

There are already some clues in the infinite number of testimonial video films, interviews, comments and mini-chats in class, institutional or personal blogs, such as Jonathan Álvarez’s, of School N° 47 in Villa 25 de Agosto. His address is www.jonathan25deago.blogspot.com. In his blog, you will find comments which refer to contact with journalists, writers, foreigners, his school teachers or his school’s headteacher. We are sure that there are many Jonathans throughout the country and the CEIBAL fairs are a good place to find and listen to them, but they could also be found sitting by the edge of a ditch, as Ema said.

Another way in which parents can give their views on this subject is by phoning the Pedagogical Coordination Office of Plan CEIBAL, or the local or national press.

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MEC centre and I helped her to enter for an OSE draw.»

They share ideas regarding how to solve different problems in connection with activities such as Scratch or Etoys, for example, which entail complex thought processes, particularly when the purpose is to animate an object and the basic principles of programming come into play.
It is obvious that they are not indifferent to the arrival of the XOs and they demand their own opportunities for participation and discussion. Some of the recurring subjects are:

- Safe surfing, which goes beyond merely avoiding websites with pornographic content.
- XO maintenance.
- How to accompany the process their children are involved in.

Their needs are unrelenting and they shake up the school in terms of how and where families can participate in their children’s education process. We shall share below some of the experiences which may be useful in establishing opportunities for participation, where virtual environments begin to be perceived as valid alternatives.

What children say and do with technology today, will be reflected in their families, the community and the Uruguayan society of tomorrow. There are already some clues in the infinite number of testimonial video films, interviews, comments and mini-chats in class, institutional or personal blogs, such as Jonathan Álvarez’s, of School Nº 47 in Villa 25 de Agosto. His address is www.jonathan25deago.blogspot.com. In his blog, you will find comments which refer to contact with journalists, writers, foreigners, his school teachers or his school’s headteacher. We are sure that there are many Jonathans throughout the country and the CEIBAL fairs are a good place to find and listen to them, but they could also be found sitting by the edge of a ditch, as Ema said.

Another way in which parents can give their views on this subject is by phoning the Pedagogical Coordination Office of Plan CEIBAL, or the local or national press.
CEIBAL Fairs: a chance to meet people
These events take place in the departments, in November. Schools present powerful experiences of the introduction of XOs into their curriculum, community work and teachers’ professional development. During these fairs, some of the experiences are selected for presentation at the National Fair, held during December, in Montevideo. Attending the fairs constitutes an opportunity to hear the voices of students, teachers, family members, authorities and the community as a whole. They have become an identifying factor in our education system, both at micro and macro levels, and have been included the Primary School yearly agenda. Teachers and children, and their families are aware of these events and look forward to being invited to them. We see this as an opportunity to increase visibility, expand the present and take advantage of experiences which would otherwise remain trapped within school walls and be lost. In this we support the line of thought of Boaventura de Sousa Santos, one of the most creative social scientists of the current intellectual scene, who provides a powerful linkage between critical analysis and alternatives.

«And what I am about to propose is the opposite strategy: to expand the present and contract the future. To broaden the present in order to include in it many more experiences, and contract the future in order to protect it» (B. de Sousa Santos, 2006:21).
Some of the alternatives he mentions are contained, for example, in a Sociology of Absences and a Sociology of Emergences.
The Sociology of Absences proposes...
replacing monocultures by ecologies in which this situation can be inverted, thus creating a possibility for absent experiences to become present ones. He refers to five ecologies: the ecology of knowledges; the ecology of temporalities; the ecology of recognitions; the ecology of trans-scales; and the ecology of productivities. «The Sociology of Emergences produces possible experiences, which do not occur because there are no alternatives, but they are possible and already exist as emergences.» (B. de Sousa Santos, 2006:31) This sociology enables us to abandon the idea of a limitless future and replace it with that of a specific future, based on these emergences. CEIBAL is a good opportunity for these experiences to emerge, as shown by fairs, workshops with parents, informal talks, meetings in the street or on the Internet by means of blogs, forums, chat sessions. It is not difficult to visualise Plan CEIBAL as a fertile ground for the theoretical contributions of B. de Sousa Santos and establish bridges towards the concept of an ecology of knowledges, or of “trans-scale”. In this search for alternatives to a linear rationale and dichotomous thinking, it is imperative to rethink schools and build new identities, without neglecting the ways and traditions which are characteristic of these institutions. A diversity of open curriculum areas which transcend the walls of the classroom and institutional time should emerge. There are several examples of this today, one of which is the Dokeos Platform experience engaged in by Andrés Rodríguez Techera, a 6th grade teacher at School Nº 145 of Paso Carrasco. «The arrival of the XOs in May marked a before and after in my work and organisation as a teacher. From the beginning I implemented the Virtual Classroom as an exclusive teaching and »

«And what I am about to propose is the opposite strategy: to expand the present and contract the future. To broaden the present in order to include in it many more experiences, and contract the future in order to protect it.» (B. de Sousa Santos, 2006:21)

What is Dokeos? It is an e-learning environment. This entailed taking a new look at curriculum content, which is now provided in a digital setting.»
use of ICT. It facilitates the creation, adoption and distribution of content, as well as adaptation to learning paces and available tools, independently of time restrictions or geographical areas. During a visit to Salto’s School Nº 5, conversations with teacher Ruben Pereira led to an appreciation of the value of another experience with the platform, which we shall attempt to illustrate by means of the remarks made by a mother, transcribed from a video published on YouTube and available on the class blog. What better resources than those of the web in order to obtain the voice of the protagonists? Amongst other features, the teacher described their participation in a forum held in Peru, and how work with parents was reinforced by the possibility of opening forums on the platform.
Parents participate in a forum available on a platform!
Experiences available on the web lead to reflections upon the fertile potential of this proposal, at a time when teachers themselves are, in general, taking their first steps in interacting with platforms such as Moodle, in the context of distance training courses.

What do the people say?
What does Lucía’s mother say?
«The work they do every day, the work my daughter does at home and the work she does at school; I really think it is first-world kind of work. I should like, above all, to highlight the work done by the intermediary between parents and students; that is, in this case, the teacher. I believe that in many homes this has been a tool which has allowed us parents to get closer to the school, the community and the medium.» (Lucía’s mother)

This testimony, together with that of other parents, teacher, students, headteacher and teacher students was transcribed from the video available on the class blog. Online: saltoeducativo.blogspot.com/search?updated-max=2009-08-31T13%3A44%3A00-03%3A00&max-results=7

By making “visible” these experiences, one coordinated by a teacher in Montevideo and another by a teacher in Salto, are we not acknowledging the tentative underpinnings of a radical democracy?
A way to start today is by strengthening participation, as proposed in General Education Act No 18,437, with face-to-face encounters alternating with distance events, such as the forums promoted by teacher Ruben in Salto. The development of these virtual environments offers the opportunity to experiment with collective forms of organisation and regulation, which foster multiplicity and variety. We have referred to the Dokeos Platform experience because it was not promoted by the more organised training echelons, which makes it even more significant, in the sense that it illustrates the potential and autonomy of the professional development of our teachers, who go beyond the general proposals provided by face-to-face or distance courses, or those offered by Educational Television or the CEIBAL Channel, amongst others.

«Cyber-space could have means of expression capable of producing live political symphonies, which would allow people to constantly invent and express complex statements, broaden the range of singularities and divergences, without in so doing adopting pre-established ways. Democracy in real time seeks the constitution of a richer “us”, whose musical model could be an improvised polyphonic chorus.» (P. Lévy, 2004:45)
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References

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APPENDIX 1

Online provision of public services by government institutions
Online provision of public services by government institutions
Uruguay has a wide range of websites and online provision of services to offer. The following information is not a detailed account of these services yet the purpose of this chapter is to present the range of possibilities offered by different public institutions and the drive to implement e-government services and assistance. The services that citizens can access through electronic means are not many when compared to the full amount of services provided by public institutions; however, it must be pointed out that not all services can be fully digitized or provided online. Considerable progress has been made in providing citizens with new links to the Government and we shall continue along this path. Nonetheless, there is still a long way to go. So far we do not have the capacity to reach a critical mass of online services and we must also recognize that hard work will be required in order to reach citizens with simple, attractive solutions that they can perceive as real improvements in their relationship with the Government. We are currently implementing specific plans to promote e-services. The acceptance has been good yet we expect a lot more visits to public websites. Heavier traffic on the websites not only allows citizens to carry out procedures online, it also reduces face-to-face attention, time-consuming procedures and costs. We have only to think about how often we need to commute to a public institution in order to deal with an ordinary over-the-counter procedure to acknowledge the benefits of online services. Uruguay is moving in the right direction in terms of institutionalizing the concept of public institution websites. Traditionally, government offices and agencies had a choice of adopting these strategies or not. Today, the State is usually perceived as a provider of services and, therefore, strategies are being pooled to consolidate them. The following is a brief account of what has been done so far; however, it is not a thorough analysis of all services available at present.
ANCAP
(http://www.ancap.com.uy)

- Calls for bids 1.0: Publication of bids, contract awards and extraordinary direct procurement. Possible to access through the ANCAP home page: http://www.ancap.com.uy. Direct access: http://www.ancap.com.uy/licitaciones/contrweb.asp. Plans are underway to replace this system with the 2.0 version. This system is under construction.
- Calls for bids 2.0: Will replace the former version. At the time of production, the following local publication will no longer be used: http://www.ancap.com.uy. This implies automatic publication of all calls for bids, contract awards and extraordinary direct procurement, on the following website: http://www.comprasestatales.gub.uy. Production of this system has not yet started.
- Applicants: A Human Resources application. Represents the first operational stage in terms of calls for applications to fill vacancies in the company, through internships, scholarships, etc. It includes an application form to be filled out by the applicant. This information is then validated according to the criteria set by the call and stored for future processing by the Human Resources Department. When calls are published, access is also available through the home page (http://www.ancap.com.uy) or directly through http://www.ancap.com.uy/llamado.
- Product prices: An application to obtain information (xmls and web services) and flash presentation. Access through website.
- Service stations: An application to obtain information and flash presentation. Access through website.
- Guide to Montevideo: Map plus service browsing (Visa 0%, Restrooms/Toilets, ATMs, movie theatres, etc.) at http://www.ducsa.com.uy Estaciones de Servicio
ANP (http://www.anp.com.uy)

- REDANP: Registration in port information distribution list.
- Tariff claims: Request for tax return.
- Customer Registration: Procedure for registration in Customer Registry.
- Updating of Customer Registry: Procedure for updating the Customer Registry.
- SAC User Request: User’s request to join the Customer Service System.
- Current Account Information: Enquiries regarding customer’s current account.
- Billing Information: Enquiries regarding services billed by ANP to the customer.
- Request for Interview: Form to request an interview with the Commercial or Customer Service areas.
- Foreign Trade Statistics: Publication of statistics relative to Foreign Trade.
- Country Profiles: Reports on Foreign Trade with certain countries.
- Request for Foreign Trade Information: Request for specific Foreign Trade information to be submitted to the Commercial area.
- Contract Award Information: Enquiries regarding contract awards resulting from public and abbreviated calls for bids.
- Tariffs and Statistics: Current tariffs at all ports managed by ANP and individual, port-by-port statistics.
- Maximum Prices: Maximum prices of services rendered to licensees or dealers.
- Infrastructure: Information on the physical infrastructure, technical blueprints, master plans, works, and images of ports under ANP management.
- Service providing companies: List of companies authorized by ANP to provide support services (customs brokers, freight forwarding agencies, port operators, shipbuilders) in each of the ports under ANP management.
- Detail of activities - Nueva Palmira: Information on the activity of vessels in the port of Nueva Palmira.
- Free Port Services - Montevideo:
Information on services provided by the Port of Montevideo as Free Port.

- **Storage Request - Montevideo:** Request to store goods in the ANP storage areas in the Port of Montevideo.
- **Arrival and Services Request (SAS in Spanish) - Montevideo:** A system used to announce arrival of vessels and request services for ships in the Port of Montevideo.
- **Information on Arrivals - Montevideo:** Assorted enquiries on the activity of vessels in the Port of Montevideo: estimated and actual arrivals, services requested, mooring, operations expected and ship information.
- **Access Control - Montevideo:** Port security system (cargo, people and vehicle access control) in the Port of Montevideo.
- **Access Permits - Montevideo:** System to request permits (ID cards) to access the premises of the port.
- **Information on Payment of the Single Customs Document - Montevideo:** Enquiries on billing relative to customers’ payment of the Single Customs Document (DUA in Spanish).
- **Container Movement Information - Montevideo:** Enquiries regarding the traceability/movement of containers in the Port of Montevideo (restricted to the exclusive use of ANP, DNA and PNN).
- **Bonded Warehousing Consultation - Montevideo:** Consultation on traceability/movement in bonded warehouses inside the premises of the Port of Montevideo (restricted to the exclusive use of the warehouses).
- **Quality - Montevideo:** Port of Montevideo information on quality: commitments, quality committee, vision and mission, certified companies, internal certifications.
- **Webcam - Montevideo:** Real-time visualization of operations in the Port of Montevideo through a webcam connected to the Internet.
- **Virtual Port - Montevideo:** Real-time virtual visualization of occupancy in the Port of Montevideo.
- **Meteorology - Montevideo:** Daily report by SOHMA (Oceanographic, Hydrographical and Meteorological Services of the Uruguayan Navy) and the meteorological station at the Port of Montevideo provided every 20 minutes.
- **Website - English and Chinese:**
Institutional information and information about ports under ANP management.

**ANTElé (http://www.antel.com.uy)**

- Telephone line request: For new fixed telephone line contracts.
- Invoice Duplicate (Fixed and mobile telephones, data): To obtain a duplicate of the latest invoice issued.
- Invoice Payment: Once the invoice is identified, payment can be made through a credit card.
- Record of duration of calls and direct long-distance dialling: ANTEL allows you to make enquiries regarding telephone calls for services in Maldonado and Rocha, on a daily basis.
- Statement of account enquiries: Enquiries about statements of account: The user can make enquiries regarding online payments.
- Changes in due date of bills: The customer can change the deadline on a given bill.
- Opportunity Management: Customers can request and manage
additional services added to their telephone service.
• Payment into account: The amount in pesos will be credited to the account indicated by the customer; if there are outstanding balances, this credit will be used to cancel them. If the customer has no debts, the amount will be credited to future payments (tax included) of forthcoming bills.
• Name changes: The name of a service subscriber may be changed (the holder of the line must handle this procedure).
• Payment of State Portal Procedures: Through their telephone bill, customers can pay the cost of procedures carried out through the State Portal of Uruguay by simply entering their personal data on the ANTEL website. They will be given a user name and password and will be able to use this practical service to pay for different public procedures that will be added to their telephone bill. At present, under this modality, customers can request an appointment to renew a national Identity Card. This service requires prior registration.
• Telecard – Balance enquiries: To enquire about your Telecard balance.
• Internet details: Through this service, customers can select the billing date they wish to enquire about and obtain a complete report on the date, time, duration and cost of each and all of their Internet connections, for the selected period. This can be obtained from the conventional telephone service or through the rural mobile service GSM/GPRS. This service requires prior registration.
• Calls for Bids: Provides information and follow-up on ongoing bids.
• Information to suppliers: Suppliers can receive information on calls for bids, postponements, additional information relevant to Terms of Reference of different Calls they are involved in. In addition, they will have access to previous information
generated by different negotiations maintained with ANTEL, during the bidding processes. For suppliers that are not yet registered in ANTEL, forms are available for this purpose.

- Payment to suppliers: Procedure, instructions, BROU (Bank) Information, request for incorporation and clarification of request.
- Detailed ANCEL (mobile phone) Bill:
  Provides a detailed electronic bill. Requires prior registration.
  - Prepaid Card: For recharging a prepaid mobile phone card.
  - Mobile Phone Messages: Enables sending messages to mobile phones and managing the service.
  - Service request: Adinet electronic mailbox, connection to ADSL, UruguayNet, DNS or other data services.
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**BPS**
(http://www.bps.gub.uy)

- Homepage: Information services, processes and procedures, statistics, regulations, payment schedules, etc., geared to all beneficiaries (pensioners, business companies, workers, etc.).
- GAFI remote connection: Geared to duly authorized companies, it provides updates on workers’ activities.
- Connection to Affiliates’ Healthcare Providers: Geared to duly authorized healthcare institutions. An update of workers’ affiliation to healthcare institutions.
- Connection to the Reconstruction of Labour Records: Geared to duly authorized enterprises. An update of workers’ activities, prior to April 1996.
- Submission of Payrolls: Geared to duly authorized enterprises. Submission of their Employees’ Payroll to the BPS.
- Collection Agents: Geared to duly authorized enterprises.
- MTSS (Ministry of Labour and Social Security) Forms: Geared to duly authorized enterprises.
- SUEP: For duly authorized enterprises.
- Planning: Seeks to replace current telephone enquiries (line number 1997) with online services. Enquiries regarding the procedure require identification card number, date and place of payment, etc.
BROU
(http://www.brou.com.uy)


- LABOUR DATA for the Automatic Credit System: A Web Service granting authorization to a company (with an agreement to retain a percentage of workers’ salaries) to modify labour data regarding its employees.
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THE URUGUAYAN POST OFFICE
(http://www.correo.com.uy)

- Post Net: A message can be written online, which is then printed, placed in an envelope and sent as a letter to its destination.
- Follow-up on deliveries: Follow-up of all correspondence delivered according to delivery number.
- Digital Signature Site: Request of certificates for Web Servers.
- Digital Signature Person: Requests of certificates for Persons.
- Digital Signature E-mail: Request, payment and delivery of certificates for e-mail.
- Postal Codes: Enquiries regarding national postal codes.
- Stamp Collectors’ Enquiries: Enquiries, updating and information regarding stamps issued.
- Local Post Office Enquiries: Enquiries regarding the location of different post offices and franchises.
- Postage fees: Enquiries regarding postage fees.

LATU
(http://www.latu.org.uy)

- Institutional Portal: Overall information about the institution, news, courses, services, etc.
- SIGLA: A system allowing customers to carry out different procedures and follow-up on them.
- SMEs Portal: A service providing information of interest to small and medium-sized enterprises.
- Suppliers Portal: A consultation system for institutional suppliers.
OSE
(http://www.ose.com.uy)

- Billing enquiries and printing of invoices.
- Enquiries regarding water consumption.
- Regulations to be downloaded.
- Procurement Forms: enquiries and printing of Forms.

PEU
(http://www.uruguay.gub.uy)

- Renewal of Identification Cards: Online request for appointment and payment for renewal of Identification Card. Payment methods: debited to customer’s account with ANTEL. Institution: National Civil Identification Bureau.
- First time Identification Card: Online request for appointment and payment to obtain Identification Card for the first time. Payment method: debited to customer’s account with ANTEL. Institution: National Civil Identification Bureau.
- Birth Certificate: Online request and payment of Birth Certificate. Payment method: debited to customer’s account with ANTEL and online banking debit. Delivery method: through the Uruguayan Post. Institution: Civil Registry Office.
- Death Certificate: Online request and payment of Death Certificate. Payment method: debited to customer’s account with ANTEL and online banking debit. Delivery method: through the Uruguayan Post. Institution: Civil Registry Office.
- Certificate for Foreigners: Online request and payment of Certificate for Foreigners. Payment method:
debited to customer’s account with ANTEL and online banking debit. Delivery method: through the Uruguayan Post. Institution: Civil Registry Office.

- Marriage Certificate: Online request and payment of Marriage Certificate. Payment method: debited to customer’s account with ANTEL and online banking debit. Delivery method: through the Uruguayan Post. Institution: Civil Registry Office.

- Deadline reminder for documents and services: A reminder of deadlines for documents or services. Document or service data must be previously registered by the user. The reminder will also provide information on the necessary steps to renew the document or service.
- Fiscal Stamp issued by the University Professionals Pension Fund for Sworn Statements relative to Taxes: A digital stamp issued by the University Professionals Pension Fund Administration that is required when presenting Sworn Statements relative to Taxes. Payment method: debited to customer’s account with ANTEL. Institution: Internal Revenue Bureau.
• Payment of procedures through ANTEL bill: public processes and procedures can be charged to customer’s account with ANTEL.
• Payment of procedures through bank debit: public processes and procedures can be paid through online debits to bank accounts. The banking institutions involved in this procedure, so far, are the following: ABN, Discount Bank, BROU, Santander (under construction).
• Payment of procedures through networks of collection agencies: Payment of procedures can be made through networks of collection agencies after the online procedure has taken place. So far, the network of collection agencies is Redpagos (under construction).
• Initiation and payment of transactions and procedures using the collections networks: Single step method to request and pay for transactions and procedures included in the scheme. Currently incorporating Redpagos and Correobanc networks (under construction).
• Apply and pay for Identification Card renewal via Redpagos: Single step method to request and pay for ID card renewal via Redpagos network (under construction).
• Request appointment and pay for Identification Card for the first time in the Redpagos network: Single step method to request and pay for renewal of Identification Card in the Redpagos network (under construction).
• Payment of public office procedures through credit cards: to pay for public transactions and procedures with credit cards.
• Payment of water bill through the State Portal: payment of water bill through credit cards or bank debit through the State Portal (under construction).
• Municipal services: Payment of Vehicle Taxes (forthcoming) and Municipal Taxes (to be incorporated shortly). Institution: Local Government of Florida.
• Apply for Passport renewal or procedure for first time issuance: Request appointment to renew or apply for a Passport for the first time. Institution: National Civil Identification Bureau (to be incorporated in the future).
• Passport Request with Police Clearance Certificate: Passport Request with automatic processing of Police Clearance Certificate (or

- Incorporation of new procedures: Joining procedures from different institutions (to be incorporated in the future).
- Incorporation of private postal services: Incorporation of private postal services as channels of distribution (to be incorporated in the future).

UTE (http://www.ute.com.uy)

- CUSTOMER SERVICES: Regarding bills: enquiries on billing data and issuance of duplicates. Enquiries relative to electricity consumption and meter readings. Meter reading reports provided by customers. Simulation of bills that allow for verification of previous bills and simulating different scenarios on the basis of different energy rates.
- CUSTOMER SERVICE: business processes and procedures. Name changes in contracts. Changes in customer addresses. Contract data updating. Approval of Requests for Supplies (only for firms that work in electric/wiring installations). Data on installation companies.
- CUSTOMER SERVICE: Personalized service. Explanations of electricity bills. Information on payment facilities and premises. Large Customers (special information and links).
• CUSTOMER SERVICE: Building a new house. Guides the customer in the efficient use of energy as well as its conservation, allowing the customer to calculate how much power is needed; information on intelligent rates and data that contribute to “reducing the cost of the electricity bill”.

• CUSTOMER SERVICE: A service for firms that carry out installations. Access to relevant Regulations. Online enquiries regarding pending issues. Enquiries regarding materials authorized in electric installations.

• CUSTOMER SERVICE: Payment of bills.


• NOT JUST FOR KIDS: Games, experiments and tips for a more rational use of electric energy while having fun.


• CALLS FOR BIDS: Information on legal tenders.

• DIRECT PURCHASES: information on new procurement by UTE, formal requirements and additional related information.

• CONSULTING SERVICES: Institutional data on activities carried out by CONEX.
Local Government Websites and Websites related to municipal activities

- Meeting of Department Administrators
  http://www.ci.gub.uy

- Local Government of Artigas
  http://www.artigas.gub.uy

- Local Government of Canelones
  http://www.imcanelones.gub.uy/contenido/home.htm

- Local Government of Cerro Largo
  http://www.cerrolargo.gub.uy/index2.htm

- Local Government of Colonia

- Local Government of Durazno
  http://www.durazno.gub.uy

- Local Government of Flores
  http://www.imflores.gub.uy

- Local Government of Florida
  http://www.florida.gub.uy

- Local Government of Lavalleja
  http://www.lavalleja.gub.uy

- Local Government of Maldonado
  http://www.maldonado.gub.uy

- Local Government of Montevideo
  http://www.montevideo.gub.uy

- Local Government of Paysandú
  http://www.paysandu.gub.uy

- Local Government of Río Negro
  http://www.rionegro.gub.uy

- Local Government of Rivera
  http://www.rivera.gub.uy

- Local Government of Rocha
  http://www.rocha.gub.uy

- Local Government of Salto
  http://www.salto.gub.uy

- Local Government of San José
  http://www.imsj.gub.uy

- Local Government of Soriano
  http://www.soriano.gub.uy

- Local Government of Tacuarembó
  http://www.imtacuarembo.gub.uy
• Local Government of Treinta y Tres  
  http://www.imtt.gub.uy

• Municipal Development Unit  
  http://www.intendencias.gub.uy

• Ombudsman’s Office  
  http://www.defensordelvecino.gub.uy

• Departmental Council of Colonia  
  http://www.juntacolonia.gub.uy

• Departmental Council of Flores  
  http://www.juntadeflores.gub.uy

• Departmental Council of Florida  
  http://www.juntaflorida.gub.uy/presentacion.html
APPENDIX 2

A Window on Nutrition and Health
A Window on Nutrition and Health
Family vegetable gardens and farms
Improving people’s nutrition
by the FAO Office in Uruguay

The Food and Agriculture Organization of the United Nations (FAO) aims to achieve a world free of hunger and malnutrition, where food and agriculture contribute to improving the living conditions of all – especially the poorest – in an economically, socially and environmentally sustainable way. Within this context, and in order to use a tool that has become essential for education in this new century – the laptop – we present a summary of educational materials created by FAO. The production of a manual called Improving nutrition through home gardening: a training package for preparing field workers in Latin America and the Caribbean (FAO, 2000), has contributed to the improvement of nutrition and food security conditions of both rural and urban populations in Latin America and the Caribbean, especially those with low levels of income, nutrition and health. It also contributes to the overall objective of the World Food Summit (1996), and to one of the Millennium Development Goals (2000) set by the United Nations Organization (Objective 1, Goal 2). The main objective is to contribute to the improvement of nutrition and food security standards of both rural and urban populations of Latin America and the Caribbean.

This training material was created on the basis of the objectives and strategies of the International Nutrition Conference (Rome, 1992), which were also adopted by the World Food Summit (Rome, 1996), in order to reduce malnutrition and food insecurity. It is through the preparation of manuals that help train and sensitize both technical staff and the population, together with the implementation of workshops, seminars, courses and other activities, that we expect to obtain results that
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will help improve the levels of food security, nutrition and health. This material, or training package, is geared to development agents such as agronomists, agricultural technicians, nutritionists, social area and communication specialists, healthcare providers, teachers, promoters, community leaders and members of the community in general. The manual can also be used in middle schools or higher education centres involved in training in the fields of agriculture and nutrition, government organizations and NGOs, amongst others.
What components are included in the training manual?
This package contains three components:
• Structured training sessions that include technical notes and support material, for the use of trainers and participants. Ten training sessions are provided.
• Information sheets for trainers and participants.
• Technical booklets for participants that can also be distributed to the community.
Training sessions include an introduction and the contents of each topic. Technical notes for trainers provide basic information for every technical subject and guidelines or activity schedules for class delivery. Information sheets for trainers and participants contain technical information on the different subjects and should be distributed and used by participants in accordance with the guidelines provided in the manual’s training sessions.

The technological booklets, which include practical information on home gardening and farm technology, are for the use of trainers and participants. However, both the booklets and the information sheets could be distributed amongst families who show interest and can use them properly.
These booklets provide information on different technological perspectives and suggestions which seek to improve home gardens and farms, so that families can increase food production, provide a wide variety of complementary crops (fruit, vegetables, and other crops, in addition to meat and eggs), and therefore add nutritional value to their usual diet.

What is the purpose of the training manual?
The materials included in this manual guide and inform trainers with regard to how family vegetable gardens and farms can significantly contribute to covering the daily food requirements of a family, with the purpose of improving their nutrition and health standards. The objective of this course is to provide technical staff and community leaders with the knowledge and skills needed to help to identify existing food and nutrition problems; find the means and opportunities available to improve production and consumption of food at home; and be able to diversify food production and consumption in order to ensure healthy individual and family nutrition.
Training materials analyse the technology for food crops such as roots and tubers, legumes, vegetables and fruit that can normally be found or produced in family vegetable gardens, according to the prevailing
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climate. Basic information is also provided in relation to breeding small farm animals.

Who attends these training courses?
Amongst the people to receive training we include agricultural extension agents, nutrition and health agents, home economics agents and rural development promoters, as well as other experts interested in or responsible for improving food security conditions, nutrition and health at community level. Participants must have completed primary education (at least two years of basic education), and have some experience in agriculture, community work or practical family nutrition. Community group leaders (women’s groups, producers’ and credit associations and others) and development workers should be encouraged to participate so that they can effectively collaborate with the improvement of community food security and nutrition.

Where should this training take place?
Training should take place preferably in a rural village or a nearby area so that participants can visit vegetable gardens and farms and work directly with families. Adequate venues for training include government or institutional training centres; schools, religious or sports buildings, community meeting halls or buildings, healthcare centres, etc. Accommodation and eating facilities should be available for trainers and participants.

How should training be carried out?
Training should be both theoretical and practical. Classrooms are needed and they should have easy access to communities in order to facilitate field work. Trainers should be prepared and motivated to use several teaching methods and techniques such as theoretical presentations, discussion and demonstration, visits to households, interviews, work groups, role-play, case studies, etc. Suggestions on how to conduct each session can be found in the technical notes for trainers. Field and home visits are recommended after the theoretical presentations, in order to reinforce and apply what was previously presented in class.
What materials are needed?
For teaching activities, the trainer should have a copy of the training material, a flipchart with large sheets of paper and a blackboard. Some of the charts, forms, information sheets and technical booklets contained in the training material can be copied onto the flipchart prior to the sessions. The material, information sheets and feedback forms to be used by participants during the sessions, should be photocopied and handed out to each trainee.

How can the knowledge provided by this manual be put into practice or implemented?
An example of this is the TELEFOOD campaign. TELEFOOD is FAO’s annual campaign, which includes a series of different activities with the objective of raising money to fund smaller projects that are directly aimed at low-income farmers throughout the world.

Uruguay is carrying out a series of projects within the TELEFOOD framework which involve very different areas; namely: vegetable production, fruit production and farm animal breeding; incorporating concepts relative to organic production, environmental awareness and sustainability. The participation of school children in the different production processes included in some of the projects represents an example of how to apply the knowledge contained in the manual, incorporating a culture of self-sufficiency in the poorest sectors. In addition, several other social groups, located in different regions around the country, also participate in these undertakings. Some examples related to TELEFOOD projects and their objectives are listed below:
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- **Installation of school vegetable gardens to be used as role models, in schools located in the outskirts of Montevideo:** Develops an experience in organic vegetable gardens in schools, in order to build the capacity of students through formal and informal tasks; this, in addition, provides an interactive experience involving local actors (students, teachers, parents, neighbourhood organizations, etc.).

- **Home organic vegetable gardens in Pueblo Saucedo (Salto):** The focus of the project, based on the agro-ecological management of small spaces, is an attempt to obtain food security through a daily basket of vegetables, legumes, and fruit that can cover all of the basic daily needs of an average family of 5 members.

- **Community vegetable garden in Paraje La Lanera (Durazno):** Due to the lack of food resources and high unemployment rates, this venture seeks to give work to women, the elderly and young people, and encourage them to work the land; in addition, it provides food for the family as well as a source of income to cover the cost of the community soup-kitchen.

- **Horticulture production in Rural School Nº 19:** Develops the experience of an organic garden in the school, in order to build the capacity of students through formal and informal work, providing an interaction experience involving local actors (students, teachers, parents, neighbourhood organizations, etc.).

- **Family vegetable gardens in Paso Potrero, Cerro Chato:** The focus of the project, based on the agro-ecological management of small spaces, is an attempt to obtain food security through a daily basket of vegetables, legumes, and fruit that can cover all of the basic daily needs of an average family of 5 members.

- **Production of aromatic and medicinal herbs in Villa Constitución (Salto):** This project targets the production, processing and sale of aromatic and medicinal herbs – both native and introduced species to the department of Salto.

- **Community vegetable garden in Barrio Hospital:** This production experience serves the Institution and its families. The experience will be undertaken with the active participation of children, families, neighbours, technical experts and the Development Division of the Local Government of Durazno.
• **Family vegetable gardens in Pueblo Cayetano:**
The focus of this project is an attempt, through the creation of a vegetable garden, to make a family self-sufficient as regards a number of vegetables, by designing a small agro-ecosystem within the plots owned by the families themselves.

• **Family vegetable gardens in Campo de Todos:**
The aim of this project is to provide food security to satisfy the daily demand for vegetables and legumes of an average family of 5, through the agro-ecological management of small spaces. Families participating in this production strategy will be able to satisfy the ever-growing annual demand for nutrients, in small spaces of only a few square metres, as the activities will be held exclusively on their own plots.

• **Horticultural production (Artigas):**
Develops a vegetable garden experience in a school, to build on the capacity of school children and provide an interaction experience involving local actors (students, teachers, parents, neighbours and organizers).

• **Horticultural production in Montserrat School (Montevideo):**
Contributes to enhancing the quality of life and eating habits of children and their families living in the area of influence of Colegio Nuestra Señora de Montserrat’s Social Work in the Tres Ombúes neighbourhood.
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- **Tool Pool – Local Council of Porvenir (Paysandú):**
  Creates vegetable gardens that become a pedagogical and educational resource that teachers can use to enhance the development of different skills in students; increases the variety of vegetables consumed, and thus improve eating habits; fosters school gardens as a show place for the production of vegetables, seeds and compost heaps; strengthens and enhances interaction between all local stakeholders involved (students, teachers, parents, producers and different social organizations).

- **Artisan food manufacturing and packing plant (Canelones):**
  Improves volume and production, positioning the product to meet the required sanitary standards; targets upscale markets, which require top-quality products, with their corresponding licences; increases the income of the beneficiaries by selling these products; invests the return on income in the development of educational activities for the community; pools efforts to open a soup-kitchen on a daily basis.

- **Greenhouse vegetable production for family farmers in the “Familias Unidas” group (Soriano):**
  Solves the food deficit suffered by inhabitants in these villages and gives them the technical tools and material for them to become self-sufficient in the provision of vegetables planted in their own plots; enables them to earn money by selling their surplus production; provides this village with a productive activity that generates self-employment, which can be an example to be followed by the whole community; acknowledges the skills of each individual through the development of a productive activity that enhances self-esteem; creates a fertile environment so that in the future, a group of families may consider working in partnership, for example, building a larger common greenhouse for commercial purposes and to supply the populations involved.

- **Greenhouse vegetable production for family producers – Ejido de Chacras Group (Soriano):**
  Provides family growers with the opportunity to diversify their production and in this way supply their families with a more balanced diet...

  Provides family growers with the opportunity to diversify their production and in this way supply their families with a more balanced diet and reach the market with a wider variety of products at better prices; prevents farmers from continuing to emigrate into cities, and increasing poverty belts. All farmers participating in this project will become production models for the area.

- **Horticultural production in Rural School Nº 35 (Durazno):**
  Develops an experience in organic vegetable gardening in the school, to build the capacity of primary and
middle school students by providing them with a specific school subject in horticultural production, involving practical application through formal and informal tasks. This activity also represents an interaction experience involving local actors (students, teachers, parents, farmers, neighbourhood organizations, etc.).

- **Group production of vegetables in greenhouses (Canelones):**
  Generates income through vegetable production; increases efficiency in the use of agro-chemicals, reducing contamination and risks for growers and consumers.

- **Family production of organic horticultural crops in greenhouses (Soriano):**
  Enables beneficiaries to cover their nutritional requirements with vegetables produced on their own land; earns additional family income through the sale of surplus production to tourists visiting Villa Soriano; creates a new point of attraction for tourists; brings productive activity to the village, generates self-employment and becomes an example to be followed by the entire community. All this is to be achieved through the implementation of Green Shops on land owned by beneficiaries. These shops will play a double role as production units and an attraction for tourists. Therefore, they will include: a greenhouse for crops, aromatic herbs and flowers; wind breaks built of local bamboo; a small pond for aquatic plants; flowers, shrubs, etc. and any other features to make the place attractive. Signs and posters will also be placed.

- **Family production of organic horticulture in greenhouses (Soriano):**
  Creates productive alternatives that generate self-employment for young people and women in Villa Soriano, in order to improve their quality of life; provides an opportunity for the village to access fresh, good-quality products at lower prices all the year round. This will contribute to enhancing the diets of all beneficiaries and the population as a whole. There are crops like tomatoes and peppers which, due to the climate, cannot be grown in autumn and winter; yet, by building greenhouses, this obstacle can be overcome. On the other hand, the installation of shade netting and irrigation systems inside the greenhouses will permit the growth of leafy vegetables such as lettuce and Swiss chard in the summer, something which is impossible at present.
• **Greenhouse horticulture production for family growers (Soriano):** Provides an opportunity for this group of farmers in Ejido de Chacras to complement their current production and reduce the marked seasonality of their produce through the construction of greenhouses. This will allow them to improve their income and, consequently, to enhance the quality of life of their families. This productive model can become the benchmark for other plots in the area. It may even help stem the migration of rural producers to the city, where they cannot find opportunities for development and end up as part of the poverty belts on the outskirts.

• **Country boys, girls, and women producing safe food (Canelones):** Improves the eating habits of 42 students in Rural School No 41, through the production of a variety of products for their own consumption, to make preserves and to barter with neighbouring families, involving boys and girls in the theoretical and practical teaching of organic-based agricultural tasks; initiates a process to recover the practice of home gardens on family agricultural plots within the area of influence of Sociedad de Fomento Rural de Migues, to improve the diet of local groups and the intake of non-contaminated product; makes it possible for three groups of women, located in remote rural areas, to generate income by marketing their surplus family garden produce, manage and grow a variety of crops.
Since the year 2000, sixty-six TELEFOOD projects have been implemented in Uruguay, amounting to US dollars 292,178 that have benefited a large number of small farmers, children and youth.

that are not produced in the region, with the purpose of sending them to tourist resorts in the department of Canelones and to Migues. The project’s beneficiaries can become agents in the dissemination of this experience, make their practice visible and be valued and recognized by local society, for their knowledge and practical outcomes.

Since the year 2000, sixty-six TELEFOOD projects have been implemented in Uruguay, amounting to US dollars 292,178, that have benefited a large number of small farmers, children and youth.

TELEFOOD crop production projects provide essential vitamins and minerals that are often lacking in people’s diets. Animal and fish production projects also provide valuable sources of protein.

In addition, the projects are designed to last, and not wither away when the initial supplies run out, or when the dry season arrives, enabling families to generate income since excess crops can be sold in local markets.

Through these projects, it is possible to foster and support one of the objectives of the first World Food Summit (1996): to guarantee sustainable food security for the entire population.

References

Healthy nutrition is a right
by María Zenia Toribio Viñas | María del Pilar Irabedra

1. The right to food
«The right to food is the right to individual or collective, regular and permanent access to quantitatively and qualitatively adequate and sufficient food corresponding to the cultural traditions of each population and which ensures a physical and mental, fulfilling and dignified life.», as defined by Jean Ziegler, United Nations Special Rapporteur on the Right to Food. As such, it is enshrined in the Universal Declaration of Human Rights, more specifically in Article 25: «1. Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the rights to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.» (United Nations General Assembly, 1948)
It is also recognized in article 11 of the International Covenant on Economic, Social and Cultural Rights (ICESCR) of 1966, which came into force in 1976, and included in General Comment 12 of the United Nations Committee on Economic, Social and Cultural Rights
(CESCR) that declares: «The right to adequate food is realized when every man, woman and child, alone or in community with others, has physical and economic access at all times to adequate food or means for its procurement.» (CESCR, 1999)

Food and, in particular, the right to food, have been discussed in the most important international summits, agreements and alliances. In this context, the Millennium Development Goals (MDG) declaration of the year 2000, where the majority of world leaders approved their commitment to direct every effort to eradicating poverty and moving ahead towards sustainable development, setting 2015 as the deadline, with specific goals, needs to be highlighted. The first of these objectives is «to eradicate extreme poverty and hunger» and one of the goals to achieve this objective is «to reduce by half the percentage of people suffering hunger, between 1990 and 2015.» (UN, 2000)

2. Content of the right to food

The concepts that protect the right to food are included in General Comment 12 of the United Nations Committee on Economic, Social and Cultural Rights, and they are understood to be the integral components of the right to food (CESCR, 1999); namely:

- **Dietary needs**: implies that the diet as a whole contains a mix of nutrients for physical and mental growth, development and maintenance, and physical activity at all stages throughout the life cycle.
- **Adequacy**: available food must be adequate to the social, economic, cultural, climate and other conditions relevant to the environment where the individuals live.
- **Sustainability**: there must be permanent access to food at present and in the future, including contingencies in case of critical situations.
- **Food safety**: food must be free from adverse substances. Protective measures must be in place to prevent contamination of food by all kinds of dangerous or toxic substances, including micro-organisms that might cause disease.
- **Respect for cultures**: food must be accepted by different cultures, which means that, apart from nutritional values, other values connected to traditions and beliefs associated with food must be respected.
- **Availability**: food should be readily available, in order to facilitate adequate nourishment; availability can be promoted through correct production, distribution and marketing.
- **Accessibility**: implies that the price of food needed to satisfy an adequate diet should be accessible and should not affect other basic needs.
3. The State vis-à-vis the right to food
The International Covenant on Economic, Social and Cultural Rights (ICESCR) is a general multilateral treaty that recognizes second generation rights, establishes means of protection and offers guarantees to the 160 signatory countries, including Uruguay. Each country must periodically report to the United Nations Committee on Economic, Social and Cultural Rights on all aspects considered to be rights to a life with dignity and on measures taken in this regard to ensure an adequate food supply in all possible circumstances.

4. Food and nutrition security
Food and nutrition security (FNS) is attained «when every person has at all times physical and economical access to sufficient, safe and nutritious food to satisfy their dietary needs and preferences in terms of food, in order to live an active and healthy life» (FAO, 1996).
This means that when a person, family or community is able to enjoy food security, their Right to Food is protected.
FNS is based on the Right to Food and has been proposed as a possibility and a tool to protect individual rights.
One of the pillars of FNS is nutritional education; namely, what people know about the principles of good nutrition and their consistent eating habits.
People must be well-informed in order to select and prepare their meals in a way that is beneficial to them, consume the right quantities and quality, and be aware of the time devoted to eating. To this end, educational tools have been developed to disseminate this information: “Food-based dietary guidelines”.

5. Food-based dietary guidelines (FBDG)
FBDGs (GABA, in Spanish, MSP, 2005) have been disseminated with the purpose of promoting healthy lifestyles and to prevent food-related diseases. One of their main features is that they are promoted at national or regional levels, respecting the sanitary and nutritional profiles of every population they are aimed at, as well as taking socio-cultural identities into account. Many countries worldwide have incorporated these tools.
The type of food commonly consumed is considered and classified in groups of similar nutritional content, with specifications regarding the quantities to be consumed in each group according to: age, sex and special physiological situations such as pregnancy and breast-feeding.
In Uruguay, the FBDGs were produced by an Interinstitutional Working Group (GIT-GABA in Spanish), with the participation of all institutions
3. The State vis-à-vis the right to food

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In Uruguay, the FBDGs were produced by an Interinstitutional Working Group (GIT-GABA in Spanish), with the participation of all institutions involved in the dietary habits of Uruguayans. They are represented by a seal (Figure 1) which depicts a plate divided into 6 sections of different sizes. Each of these sections represents one of the food groups and its size is proportional to a sufficient and healthy daily intake, in order to ensure a balanced diet; each element of the plate in harmony with the rest.

The FBDGs, as shown in Table 1, specify the portions recommended by group, according to nutritional needs defined by the country for its population after taking into account their specific requirements.

Figure 1: FBDG Uruguay logo
The Guidelines also include ten messages with contents that address the most significant problems identified in most of the population. This is what the messages recommend:

**Table 1: Guidelines for food intake by food groups, in portions, for Uruguayans over the age of 2**
(taken from the Ministry of Public Health, 2005, and modified)

<table>
<thead>
<tr>
<th>FOOD GROUPS</th>
<th>Children 2* to 6, older adults</th>
<th>Older children, female adolescents, adult women, older adults</th>
<th>Male adolescents, adult men</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Approx. 1500 Kcal diet.</td>
<td>Approx. 2200 Kcal diet.</td>
<td>Approx. 2700 Kcal diet.</td>
</tr>
<tr>
<td>1. Cereals and legumes</td>
<td>3 portions</td>
<td>5 portions</td>
<td>7 portions</td>
</tr>
<tr>
<td>2. Vegetables and fruit</td>
<td>4 portions</td>
<td>5 portions</td>
<td>6 portions</td>
</tr>
<tr>
<td>3. Milk and dairy products</td>
<td>2 portions **</td>
<td>2 portions**</td>
<td>2 portions**</td>
</tr>
<tr>
<td>4. Meat and eggs</td>
<td>1 portion</td>
<td>2 portions</td>
<td>3 portions</td>
</tr>
<tr>
<td>5. Oils and fats</td>
<td>1 portion</td>
<td>2 portions</td>
<td>3 portions</td>
</tr>
<tr>
<td>6. Sugar and sweets</td>
<td>3 portions</td>
<td>4 portions</td>
<td>5 portions</td>
</tr>
</tbody>
</table>

* Very young children often consume quantities that are smaller than those established in the servings provided as a reference; this must be taken into account so as not to force their diet.
** The recommendation for women after menopause, pregnant women and adolescents is to increase their intake of milk and other dairy products to 750 cc a day. In all these groups there is an increased need for calcium. For breast-feeding women, the necessary daily milk intake is 1000 cc.

**Message 1:** Keep healthy by consuming a daily diet that includes a variety of foods from each of the six groups.

**Message 2:** Eat moderately according to the portions indicated for each food group in order to maintain a healthy weight.

**Message 3:** To perform better during the day, start your day with a breakfast that includes milk, bread and fruit.

**Message 4:** Dairy products are necessary for all ages. Try to drink at least half-a-litre of milk a day.

**Message 5:** Include seasonal vegetables and fruit in all your meals.

**Message 6:** Reduce your intake of soft drinks, sugar, sweets, candy and pastries.

**Message 7:** Control your intake of meat, cold meat cuts, sausages, butter, margarine, cheese, cream, mayonnaise and fried foods that contain high levels of fat.

**Message 8:** Reduce your intake of salt and of food containing high levels of salt.

**Message 9:** Choose, among the food groups, those that are best suited to your family budget.
Examples of these microorganisms are bacteria, viruses, yeasts, parasites, some of which – even when present in food – do not alter it: they do not change its odour, taste or texture and, for this reason, the aspect of a food product is not a reliable indicator of safety.

Message 10: To prevent food-borne diseases, be careful regarding food hygiene at all stages from purchase to consumption. For further details the Manual for the promotion of healthy eating habits for the Uruguayan population (MSP, 2005) is recommended.

6. Food safety
This point refers to food safety, which is included in message 10 of the FBDGs. We have chosen it in order to further analyse the subject. One of the main factors of Food and Nutrition Security is the adequate biological use of the nourishing substances we eat. If food is not safe, we are exposed to disease and in these conditions, we shall not be consuming sufficient nutritious substances and there will be no Food or Nutritional Security. Foodborne diseases are diseases caused by the intake of contaminated food or beverages. The main food contaminants are biological, physical and chemical agents. Biological agents (micro-organisms) are the most common cause of foodborne diseases. Examples of these micro-organisms are bacteria, viruses, yeasts, parasites, some of which – even when present in food – do not alter it: they do not change its smell, taste or texture and, for this reason, the
appearance of a food product is not a reliable indicator of safety. Bacteria grow by multiplying. Like all living things, in order to grow, they need food, water, time and adequate temperature. Some food, such as meat, fish, rice, milk, eggs and cheese provides a favourable environment for bacteria to thrive. In ideal conditions, bacteria can double every 15 minutes, which means that the number of bacteria can increase from one to 16 million in 6 hours. They can also be produced by chemical products if they reach and contaminate the food. Some this are:

- Metals and environmental contaminants (for example, lead and mercury).
- Chemical substances used in food processing.
- Inadequate use of pesticides.
- Cleaning products.
- Inadequate use of food additives (such as preservatives and colourings).

Some physical elements can also cause foodborne diseases, for example, pieces of glass, wood, screws, wire, stones that accidentally end up in the food.

In 2001, the World Health Organization (WHO) formulated a series of simple rules for general application called “The Five Keys to Safer Food” (WHO, 2001), that have been translated into more than 40 languages...

1) Keep clean
Look after your personal hygiene and keep your working area clean. Protect food in all kitchen areas.

Hand washing – Wash your hands often: always after using the toilet, after touching animals, changing diapers, blowing your nose, touching garbage or any other circumstance you think could contribute to contamination. To wash your hands, first wet them with running water, apply soap for at least 20 seconds, rinse with running water and dry with a paper towel, preferably.

Working areas hygiene – Wash and disinfect all surfaces and equipment used for food preparation. Clean any spilled liquid or food immediately. Pay special attention to cutting boards. Protect food and the kitchen area from insects, pets and other animals.
2) Separate raw and cooked foods. Avoid cross-contamination
Raw food, especially red meats, poultry, seafood and their juices may contain dangerous micro-organisms that can be transferred to other foods during preparation and conservation. This transference is called “cross-contamination”. To prevent it, separate raw from cooked foods from the beginning: when shopping, separate raw red meat, poultry and seafood from other foods. In the refrigerator, store raw red meat, poultry and seafood below cooked or prepared food to prevent juices from spilling on them. Wash and disinfect utensils that have been used to handle raw food. The separation should be done not only when cooking but in all the stages of food preparation.

3) Cook thoroughly
Bacteria multiply easily at temperatures between 6 and 65 ºC, the so-called “danger zone”. To ensure that temperature kills bacteria, food should reach an interior temperature of at least 70 ºC.
Certain foods require special attention when they are cooked, such as minced meat, rolled roasts, large joints of meat and whole fowls. In the case of red meat and poultry, make sure that they are completely cooked, that the juices are clear and not pink. When reheating food, do so thoroughly. Bring foods like soups and stews to boiling point and keep them boiling for at least 1 minute.

4) Keep food at safe temperatures
Do not leave cooked food at room temperature for more than 2 hours. The temperature of the refrigerator should be below 5 ºC. Do not keep leftovers in the refrigerator for more than 3 days or reheat them more than once. Do not thaw frozen food at room temperature, plan meals in advance and defrost in the refrigerator. Food that is defrosted in microwave ovens should be cooked immediately.
5) **Use safe water and raw materials**

Raw materials used to prepare food, such as vegetables, water and ice could be contaminated with micro-organisms or dangerous chemical products. Several foodborne diseases are considered to be **“water-transmitted”** because they are caused by contaminated water (type A hepatitis, typhoid fever, cholera, etc.). Use foods that have been processed for safety, such as pasteurized milk. Wash fruit and vegetables thoroughly. Do not buy tinned food if dented, leaking, swollen or rusty. Do not use home-made preserves, that is to say food with no guarantee of having been manufactured under the adequate sanitary conditions and which have not been licensed by the competent regulators. Preserved food that has not been properly sterilized may be dangerous and cause a mortal disease called **“botulism”**.

It is important to keep in mind that most of the factors that cause food borne disease outbreaks are related to the inadequate handling of food, so these recommendations are intended to inform in order to foster healthy habits and thereby protect the Right to Decent Food.

For additional in-depth information, there is a website targeted at safer food that provides a link to the *Workbook on “Five Keys to Safer Food” (Teacher’s Manual)* (WHO, PAHO, INCAP, 2006a), an educational tool to support teaching of the *“Five Keys to Safer Food” (Contents Manual)* (WHO, PAHO, INCAP, 2006b) for primary school children. It is coordinated by the Pan-American Health Organization (PAHO) and is part of the Global School Health Initiative, promoted by WHO, PAHO and the Nutrition Institute of Central America and Panama (INCAP in Spanish).
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Dengue fever can no longer be considered a potential risk to our country but rather a real and imminent sanitary problem. Over the last ten years, despite a lack of autochthonous dengue cases, steps have been taken, and efforts and economic resources invested to prevent the circulation of this virus. A long list of macro and micro factors are combined in this disease and lead to a very dangerous situation that is, at present, difficult to avoid. The following are but a few examples:

- Globalization, through increased regional and intercontinental travel (tourism, migrations and business) can spread the virus and its vector all over the planet in a matter of hours.
- Uncontrolled demographic growth: the world population trebled in seventy years, rising from 2 billion in 1930 to 6 billion in 2000.
- Environmental disorder rampant in large urban centres and their poverty belts, so characteristic of Latin America, where the mosquito finds abundant nourishment (human blood) and breeding grounds (plastic household containers with water), mostly made of non-

Dengue Fever
Knowledge leads to prevention
by Gabriela Willat Real de Azúa | Mario González Sobera
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- Biodegradable materials where the insect can lay its eggs.
- Climate change and the ensuing global warming have extended the “biological boundaries” of *Aedes aegypti*. Up until very recently, we were able to restrict its presence, with relative success, to the territory between latitudes 35°N and 35°S. In this new subtropical strip of land which Uruguay is part of, with barely defined seasons and without extreme temperatures, this and other vectors make a more permanent residence.

As the *Aedes aegypti* also transmits yellow fever (which can be 60% lethal) and this disease devastated the main cities in Latin America until the late 19th century, an Eradication Plan for the Hemisphere was implemented. It was very successful while it lasted: 80% of the infested area – the equivalent of 12 million square kilometres – was vector-free. By 1962, this mosquito was eliminated in 18 countries, including several Caribbean islands. In subsequent years, only three more countries were able to reach this goal while many others were being reinfested. Uruguay reached the goal in 1958 and maintained that status for 39 years. 

Unfortunately, several of the mentioned factors and the lack of economic support for the Plan favoured the rapid expansion of the disease, leading to the current situation where re-colonization has spread to every country in the Americas, with the exception of Canada and continental Chile (Easter Island has had *Aedes aegypti* and dengue since 2001). (See Map 1)

This health disorder is one of the
so-called emerging and re-emerging diseases; it is transmitted by mosquito-bite and spreads like a huge epidemic wave. A large number of people become ill at the same time, in a very short period, and they invariably overwhelm any existing healthcare systems.

*Its repercussion is enormous given the fact that thousands of patients must be treated simultaneously and they, in turn, can neither work nor study for an average of at least two weeks.*

Losses due to labour and school absenteeism, medical expenses, tourist cancellations, make dengue a viral disease with a severe economic and social impact. Thus, Cuba estimated at around 103 million US dollars the cost of its 1981 epidemic, which in addition took the lives of 158 people. Puerto Rico has spent 200 million US dollars since 1977 in succeeding epidemic cycles. Brazil spends 4 million US dollars a week, yet it accounts for the majority of annual cases in the Americas, coming close to one million victims in 2002.

**The vector**

Most people think that this mosquito is larger in size than others, as they do not take into account that photos depicting them in leaflets and handouts have been blown up. According to illustrations, the mosquito is very attractive, featuring silver-shaded, lyre-shaped scales on its back and ringed legs. We must not forget, however, that normally the naked eye cannot detect these features and the mosquito is smaller and darker than most ordinary mosquitoes. *Aedes aegypti* is a typically urban and domestic mosquito. It lives in cities because there it finds two elements that are essential to its survival: human beings, from whom the female insect feeds in order to lay her eggs and household clean water containers (buckets, tins, discarded bottles, tanks, drums, tyres) providing damp surfaces on which to deposit eggs. Once the eggs are in contact with water, they produce embryos which turn into larvae, then pupae and finally emerge as adults.
The life cycle varies according to temperature and the humidity in the environment; during the summer it may take as little as one week while in winter the cycle can take over one month. Therefore, September-May is the most risky period in our country, depending on conditions during spring and autumn each year. It must be pointed out that the egg stage is highly resistant to weather conditions and eggs deposited on the dry walls of a container can survive for up to two years and still be viable. Larvae stage also resist low temperatures and some have been found alive under sleet; what they essentially need is organic matter to feed on. It is for this reason that they compete against each other and against larvae from other mosquito species. Pupae, on the other hand, do not feed and are simply the final stage of the full metamorphosis, a pre-adult stage, and when they emerge as adults it takes a few hours for their exoskeleton to become hard, allowing them to fly. These are the mosquitoes we see standing on the surface of water; they have just been born after having

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completed their water cycle. From now on their goal will be to reproduce; for this reason, female mosquitoes will look for blood (they prefer human blood to any other animal) so that they can lay eggs; whereas male mosquitoes will look for females to mate with. Adult mosquitoes in this species are day insects so they feed early in the morning or in the evening at sunset. Their adult life span can be about a month. The adult mosquito is more sensitive to cold, especially if intense and over a long period of time. Yet we must remember that they find shelter inside dwellings and this is how they usually survive the winter. We usually see them resting behind furniture or curtains, in bathrooms or quiet areas with little traffic inside dwellings where room temperature is seldom below 10 °C. Their area of action tends to be short; 100 metres is enough for them to obtain nourishment and find breeding grounds, so their dissemination is rather passive. They can move from place to place in cars, airplanes or ships, which is why it is so important to implement surveillance at border crossings, ports, airports, access routes, as this is how mosquitoes enter and settle in otherwise mosquito-free areas. Uruguay confirmed the re-introduction of this mosquito in February 1997 and today we know it has spread throughout the departments in the Western coastal areas and, for the last couple of years, in several neighbourhoods in the capital city. (See Map 2)
Dengue Fever

Dengue fever is a viral disease that has been identified as one of the main public health problems worldwide. The estimate is that every year between 80 and 100 million people are infected in 100 countries. Of this number, 550,000 infected patients are admitted into hospitals and 25,000 die of dengue. In Uruguay, the latest autochthonous case recorded was in Salto in 1916. All cases confirmed and reported in recent years have, in general, originated in other countries in the region where the disease is endemic or where there are proven epidemic outbreaks.

Dengue is a viral disease that only affects human beings; it is transmitted by the bite of an *Aedes aegypti* mosquito that has previously fed on a sick person. Hence for the disease to occur the following triangle is needed: “a person with the disease, an *Aedes aegypti* mosquito, a person who is healthy or sensitive to the disease”.

The symptoms, similar to influenza, make it confusing in terms of pathology and diagnosis. We should think it possibly exists when there are too many cases of “flu” during the summer.

The disease is recognized by the presence of high body temperature, painful aches in legs and joints, a temporary rash, fatigue, severe headache and pain behind the eyes. These symptoms last for a week to 10 days but it may require longer bed rest. It frequently strikes in very asymptptomatically or mildly, especially in children.

Unless there are other complications in elderly people, or the disease combines with other chronic pathologies, it tends to be a benign and passing disorder that heals without after-effects.

As it is viral there is no specific treatment for it; the only recommendation is plenty of rest, pain-killers for pain relief and antithermics to reduce the fever.

Unfortunately, there is no vaccine yet, although there has been progress in developing one.

People who suffer from dengue fever are immune for the rest of their lives; however, as there are 4 strains of the virus called serotypes 1, 2, 3 and 4, the immunity will only act against the serotype that caused the disease. Therefore we could, with a great deal of bad luck, suffer from dengue four times in our lifetime. As from the second infection, a percentage of the population may develop a severe form called Haemorrhagic Dengue or Dengue Haemorrhagic Fever, which requires hospitalization and immediate treatment.

Death by dengue is due, in general, to the onset of shock that can be
Plan CEIBAL in Uruguay

prevented if both consultation with a doctor and hydration are performed at an early stage. For this reason, it is very important to recognize the so-called early signs (severe abdominal pain, uncontrolled vomiting, fainting, paleness, profuse sweating, bleeding, bruises, etc.) that indicate the onset of hemorrhagic dengue.

Prevention and control
More than a century has gone by since Carlos Finlay, a Cuban physician, related Aedes aegypti to the transmission of yellow fever and installed the controls that drastically reduced the vector’s density on the island, thus abruptly cutting viral circulation. The most effective way to prevent its transmission or to control an epidemic is to reduce the population’s exposure to the mosquito. This can be achieved through vector control and the use of man/vector barriers.

1) Mosquito control
This control can be either physical or mechanical, when we refer to the destruction of potential breeding grounds; this can be achieved via the well-known descacharrización (the elimination of all useless containers or cacharros in Spanish) method or by protecting containers by means of solutions that are economical, simple and easy to apply so they no longer pose a risk. For example: place buckets and bottles upside down, put sand on the plates under plant pots, place suitable lids on top of high tanks, do not leave tyres in the open, remove stoppers from sinks and remove litter from gutters, etc. After a rainfall we must get used to the idea of patrolling the area around our dwelling to check for accumulated water; check front and back yards, and the roof, as part of a careful routine. These are simple tasks and some of them could be even carried out by children.

We can also resort to biological control that includes manipulation of other living organisms, by using them strategically to tip the natural balance against the vector. Thus, larvae-eating fish are used, as well as BTI (bacteria with toxins that kill mosquito larvae) and other parasites. These are all methods that aim to specifically destroy mosquitoes at their different life stages, without harming the environment.

Finally, we must mention chemical control – probably the first that comes to mind when thinking of combating pests – and the last we should resort to given the negative consequences it may lead to. The use of insecticides must be entrusted to the hands of trained experts who will have appropriate personal protection. It is important to remember that abusing or overdosing on chemical products may lead to severe intoxication, environmental contamination and resistance-related phenomena in the very insects we want to exterminate.
Insecticides can be classified as larvicides or adulticides, depending on the stage of the mosquito life cycle they attack. Adulticides may be applied with spraying machines that wet the surfaces where mosquitoes stand, around containers that cannot be eliminated. Ultra Low Volume machines can also be employed; they produce clouds of very tiny droplets of product that impact insects in flight. To control Aedes aegypti, the World Health Organization recommends the use of ULV with trawler only in case of an epidemic, in order to interrupt transmission.

Eliminating breeding grounds remains the key to prevention and control.

2) Use of man/vector barriers
This is all about avoiding mosquito bites through personal protection or by excluding insects from dwellings. For this purpose thick clothing is recommended so that most of the body is covered (which might be rather difficult because we are talking about the warm season); spraying the body with insect repellents before getting dressed; installing mosquito netting on door and window openings; and, lastly, minimizing outdoor activities during periods when mosquitoes are most active.

Contingency Plan in Uruguay
After 39 vector-free years, and as a result of routine inspections carried out in those areas posing higher risks in the national territory, the re-introduction of the vector was confirmed. The first area detected positive for Aedes aegypti was Colonia del Sacramento, where larvae were found in an abandoned boat in an empty lot belonging to the National Prefecture, next to the main port terminal in this departmental capital city. A National Contingency Plan was immediately launched with the support of PAHO/WHO, whereby departments were classified as positive, negative or at high re-infestation risk. As was to be expected, other localities along the Western coastline, near international bridges with a great deal of vehicle traffic, were declared positive. Entomological surveillance was originally based on visits to dwellings and subsequently complemented by the use of mosquito traps – first larva traps and then ovitraps – very useful tools in low-infestation or negative
areas, as these tools can be kept in action with the help of a reduced number of human resources.

In each department of the country, the positive localities were, initially, the capital cities located near borders; later, other sites were detected and added to the list. In general, very few cities and towns have become negative, despite timely and early action.

The cases of Tacuarembó and Maldonado must be mentioned, where specific detections were rapidly controlled and subsequent surveillance has failed to identify a new source of infestation. Infestation indices have remained almost unchanged during the latest summer seasons and the coastal cities of Salto, Mercedes and Fray Bentos account for between 95% and 98% of positive dwellings in the country. The number of departments where the presence of the vector has been detected has changed from one year to the next, reaching 10 on several occasions and reaching the capital city in 2007, when one ovitrap inside the port area proved positive. Today the vector has been found in most of the territory covered by the capital city, a situation that leaves 2 million inhabitants at risk.
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APPENDIX 3

Plan CEIBAL in Middle School
A work proposal
The expansion of Plan CEIBAL to cover Middle School requires focusing on those aspects that could advance its firm implementation as an educational tool. This process, involving both Middle School and Vocational and Technical Education, compels us to reconsider the relationship between society, technology and education, in the context of a public education policy proposal. This proposal is framed within the general and specific objectives of Plan CEIBAL for Uruguay. […]
III. General Objective
Foster the appropriation of an educational and pedagogical ICT-related model that favours the collective building of knowledge which – through the integration of technology into the classroom – strengthens equal opportunities.

III.1. Specific Objectives
1) Strengthen the roles of Inspectors and Principals so that they can help establish leader teams within the institutions in order to propel technology appropriation processes.
2) Promote training methods in schools, as well as tuition and mentoring as strategies with the highest potential for training and updating teachers.
3) Facilitate the production of and access to educational material that can support teachers’ classroom work.
4) Attempt to reinforce local networks that contribute to optimizing human and material resources, while opening institutions to the community, within the framework of a gradually growing process to include students in education centres.
5) Support processes aimed at redesigning the architecture and equipment of schools, in order to promote the creation of education centres that meet the requirements of new classroom dynamics resulting from the implementation of the 1:1 modality.
6) Foster classroom practices that contemplate a proactive leading role for students in the learning process, through innovative strategies relevant to the context of the knowledge society; to enhance students’ and teachers’ learning by making significant changes in classroom practices.

IV. Strategies, Activities and Indicators

IV.1. General Strategy
Consolidate collaborative links between all stakeholders involved, decision makers and beneficiaries, organizations supporting the Plan, UDELAR, LATU, professional and civic associations, and all local, national and international stakeholders, specialists and volunteers, public and/or private, who can collaborate in supporting, advising, financing, investigating, assessing, reorienting the implementation of Plan CEIBAL in Middle School, in accordance with the objectives mentioned above.

IV.2. Strategy for Specific Objective 1
Promote in-service training to optimize performance and consolidate leadership among Inspectors and Principals, given the challenges facing education environments with the advent of the 1:1 modality at the level of Middle School.
IV.2.1. Activities and Indicators for Specific Objective 1

Activities
- Hold workshops for Inspectors to become familiar with the equipment, its potential and limitations.
- Hold workshops for Inspectors in the same subject, or sectors within subjects, to produce guidelines for teachers, formulate projects, and communicate successful experiences.
- Provide groups of Inspectors with XO laptops so they can work with them to guide the work of teachers in different subject areas.
- Assign responsibility regarding supervision and the nexus between institutions and the Plan CEIBAL Committee to Management Inspectors (CETP) and Secondary Education Institute and School Inspectors (CES).
- Organize meetings of Principals and Deputy Directors from all over the country to sensitize them in relation to this proposal, and to guide them in the formulation and leadership of Middle School Projects that contemplate the new classroom scenarios.
- Encourage participation in events, seminars, meetings and congresses on issues related to new technologies in education.

Indicators
- Number of meetings held.
- Inspectors’ valuation of the quality of the resources offered by Portals.
- Number of equipment units made available for Inspections.
- Number of teachers per school involved in the institutional strategies that foster the use of new technologies.
- Number of agreements reached with Middle Schools related to the use of XOs in classrooms.
- Availability and extension of use of official documents drawn up as a result of the changes introduced in management due to the implementation of the Plan (for example, protocols for use, teacher coordination for the daily use of connectivity, notes to families, etc.).

IV.3. Strategy for Specific Objective 2
Address the demand for specific training originating in schools – as part of the appropriation process of Plan CEIBAL – according to interests or needs specifically identified by their staff. To do so, it is necessary to make use of all the resources offered by teams of trainers from different institutions (LATU, RAP CEIBAL, CODICEN, CES, UDELAR and others) but mainly to work towards building the existing capacity of institutions by creating the role of the school Referente TIC (ICT Reference Point) within the existing IT Lab Assistant Teachers team.
IV.3.1. Activities and Indicators for Specific Objective 2

Activities

• Hold meetings, seminars, symposiums and/or other type of workshops, in response to the demand of stakeholders involved, either teachers or inspectors and principals, resorting to the most suitable human resources.

• Organize meetings to work at the schools when they should require it, fostering the autonomy to call for meetings and acting as a liaison so that initiatives can be implemented in a timely and satisfactory way.

• Provide school libraries with XO equipment for the use of teachers, so they become familiar with the potential and limitations of such equipment, while they work individually or as a team, to prepare learning activities and resources.

• Organize face-to-face and online teacher training courses for IT Lab Assistant Teachers, so that they are able to provide support regarding the proper use and integration of technology to be used by their colleagues in different areas, as well as offer support in planning and managing a classroom that has incorporated information technologies.

• Implement digital saturation pilot experiences in each department that – following the general guidelines of this proposal – allow for the evaluation of different technological working environments in order to select those that are most appropriate for Middle School students.

• Participate in events, seminars, symposiums, and conferences that address issues relative to new technologies in education.
Indicators
• Number of meetings held.
• Number of institutions that have developed projects on new technologies or regular teacher training activities on the subject.
• Number of Middle schools with working computers in libraries.
• Average frequency of computer usage in institutions.
• Number of training events for ICT Reference Points.
• Percentage of teachers participating in events relative to new technologies.
• Number of projects implemented with new technologies; number of teachers applying new technologies in classrooms; type of activities and resources tried; type of institution management renovation in response to new technologies; activities to provide parents with opportunities to access new technologies.
• Type of action taken with institutions that have computers and are carrying out the pilot experience.

IV.4. Strategy for Specific Objective 3
To strengthen working teams that are currently developing educational resources in different National Portals (Uruguay Educa, CEIBAL), so that teachers may have access to a significant supply of teaching material and learning resources.

IV.4.1. Activities and Indicators for Specific Objective 3

Activities
• Appoint Portal managers who can respond, within the Plan CEIBAL framework, to the needs of Middle School.
• Train the teams responsible for content so that they are ready to produce resources of increasingly good quality, while disseminating successful experiences achieved by students, teachers and/or parents in Middle School.

Indicators
• Stakeholders’ valuation on how the Portal Coordinators’ work plan matches the requirements needed to incorporate Plan CEIBAL in Middle School.
• Number of training sessions for those responsible for content.
• Type of actions undertaken to unify strategies or define complementarities to optimize the use of Portals.

IV.5. Strategy for Specific Objective 4
Coordinate actions with other organizations that support the Plan CEIBAL and collaborate with its implementation at local levels, helping
to solve difficulties that hamper the normal operation of the equipment and its connectivity, while cooperating with the institutions to provide parents of Middle School students with an opportunity to access the XOs that have been delivered to their children.

IV.5.1. Activities and Indicators for Specific Objective 4

Activities
• Facilitate the link between schools and existing organizations, which are in a better position to offer immediate support to specific requirements related to technical service and guidelines for the use of equipment, as they constitute a decentralized network.
• Hold IT workshops for parents.
• Establish school management routines through the use of XOs (for example, a database of e-mail addresses to communicate information regarding schedules for meetings, exams, school activities, institutional announcements, teacher absences, student absences, extra-curricular activities, etc.).

Indicators
• Number of activities coordinated between organizations supporting the Plan and the institutions.
• Type of services offered.
• Number of IT workshops targeted at parents.
• Number of parents attending workshops.
• Type of communication routines established between schools and students’ parents.

IV.6. Strategy for Specific Objective 5
Participate in actions to advise and accompany activities related to the initiation of a process to readjust school buildings and institutional equipment and furniture to meet the new classroom situation, so that everything is in place in good time, for the development and strengthening of the pedagogical-educational dimension of the Plan.
IV.6.1. Activities and Indicators for Specific Objective 5

**Activities**
- Establish inter-disciplinary committees to consider needs in terms of building and furniture for the 1:1 modality, in order to enable the new classroom dynamics.
- Promote calls for pilot projects that could help study the application of different solutions in order to make informed decisions as to which solutions are most functional in each context.
- Implement several pilot projects to evaluate the results of the adjustments introduced.

**Indicators**
- Type of committees created to address these issues.
- Number of projects responding to the calls.
- Number of pilot projects effectively implemented.
- Percentage of adjustment work carried out in buildings.
- Percentage of furnishings purchased to implement pedagogical and educational innovations.

IV.7. Strategy for Specific Objective 6

**Activities**
- Advise and accompany students and teachers in their learning processes, by carrying out significant changes in classroom practices and encouraging collaborative work; to foster classroom practices that enhance learning through innovative strategies that match the knowledge society context.
- Create intra- and interinstitutional networks for teachers, students, and teachers + students, thus encouraging them to become actively involved.
- Hold teachers’ meetings to exchange and favour the rational incorporation of ICTs in curricular activities.
- Carry out inter-disciplinary projects to foster collaborative work.
- Create opportunities to exchange successful teaching practices in the use of ICTs.

**IV.7.1. Activities and Indicators for Specific Objective 6**
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• Create intra- and interinstitutional networks for teachers, students, and teachers + students, thus encouraging them to become actively involved.
• Hold teachers’ meetings to exchange and favour the rational incorporation of ICTs in curricular activities.
• Carry out inter-disciplinary projects to foster collaborative work.
• Create opportunities to exchange successful teaching practices in the use of ICTs.

Indicators
• Number of meetings and symposiums held.
• Number of intra- and interinstitutional networks built, and number of students actively participating in them.
• Number of interdisciplinary projects implemented.
• Percentage of collaborative work carried out in relation to total activities.
**1:1 Method:** An educational model in which each student is provided with a resource. At present, this consists in one laptop per student.

**Adinet:** ANTEL’s e-mail service.

**ADSL:** Asymmetric Digital Subscriber Line, a technology which enables access to the Internet through a telephone line.

**AGESIC:** Agency for the Development of Electronic Government and the Information and Knowledge Society.

**Agraphic:** One who is incapable of writing or does not know how to write.

**ANCAP:** National Fuel, Alcohol and Cement Administration (State-owned oil company).

**ANEP:** National State Education Administration.

**ANII:** National Agency for Research and Innovation.

**ANP:** National Port Administration.

**ANTELPEDATA:** A division of ANTEL responsible for providing data transmission and Internet access services.

**Bandwidth:** An electronic device’s capacity and data transmission frequency.

**Bibliored:** Network of Public Libraries in Montevideo.

**Bicentenary:** Refers to the bicentennial commemorations of the independence of Ibero-American countries, which take place between the years 2009 and 2021.

**Biodegradable:** A chemical compound which can be degraded by biological action.

**Blog:** Also known as weblog; a website which is regularly updated and provides a chronological compilation of written items or articles by one or more authors, with the most recent appearing first. The author or authors reserve the right to leave whatever they consider relevant available on the blog. The term derives from the words web and log.

**BROU:** Bank of the Republic (State-owned commercial bank).

**Browser:** A software application for locating, viewing and retrieving, information on the World Wide Web, through the use of a graphic interface.

**BTI:** A bacteria whose toxins kill mosquito larvae.

**CASI:** Centre for Access to the Information Society; part of an ANTEL network of telecentres.

**CEIBAL:** Educational Connectivity of Basic Computing for Online Learning.

**CEIP:** Early and Primary Education Council (previously CEP).

**CEIP:** Primary Education Council (now CEIP).
**CeRP**: Regional Teachers Centre.
**CES**: Secondary Education Council.
**CESCR**: Committee on Economic, Social and Cultural Rights of the United Nations.
**CETP**: Technical-Vocational Education Council.
**Chat**: Refers to written communication over the Internet between two or more persons, which takes place instantly and in real time. The persons involved can be anywhere in the world.
**Cholesterol**: A fat molecule produced in the body and which can also be ingested with the food a person consumes. In excess, they cause atherosclerosis.
**CODICEN**: Central Directing Council, the guiding body of ANEP.
**Constructionism**: A learning theory developed by Seymour Papert (MIT), which states that learning is much improved when children commit to the construction of meaningful output. “The best learning will not derive from finding better forms of instruction, but from offering learners better opportunities to construct.” When children construct things in the external world, they simultaneously construct knowledge within their minds, which, in turn, generates new constructions in a self-reinforcing cycle.
**Culture factories**: A joint initiative of the MEC’s National Culture Directorate and MIDES, through the Culture and Social Inclusion Programme. Their mission is to strengthen human and productive capital in different localities in the interior of the country, fostering the development of cultural productive undertakings. They are local socio-cultural interaction opportunities, with training and recreational activities, which promote productive areas through the provision of advice and training for small or medium centres of cultural production. They are called “factories” because they produce cultural articles (crafts, dolls, books) which are subsequently sold by their producers.
**Cumulative-receptive**: Refers to a model of learning which consists in receiving the information provided by the teacher and practising skills in consequence.
**Cybernaut**: A person who surfs the Internet.

**D**

**Dengue fever**: A virosis suffered only by man, acquired through the bite of the *Aedes aegypti* mosquito which has previously fed on an infected person. For the disease to occur, a “diseased person, *Aedes aegypti* mosquito, healthy or susceptible person” triad must exist.
**DFPD**: Teacher Training and Development Directorate.
**Digital divide:** (or digital gap) A term which refers to the socio-economic difference between communities that have access to the Internet and communities that do not, although such inequalities can also refer to all of the new Information and Communication Technologies (ICTs), such as personal computers, mobile telephony, broadband and other devices.

**Digital immigrants:** As opposed to “digital natives”, refers to persons who came into contact with digital technology for the first time after they became adults. This is not a “native tongue” for them.

**Digital native:** As opposed to “digital immigrants”, this term refers to persons who have been in contact with digital technology from birth. This is a “native tongue” for them.

**Dissolution of self:** A feeling or perception in which the person’s self changes, “dissolves” and the mind remains in a state which is different to the person’s habitual state; absorbed, out of time and space.

**Distance learning:** The use of electronic means in order to enable teaching and learning to take place in different physical locations.

**DNA:** National Customs Directorate.

**DUA:** Single Customs Document.

**E**

**ECLI:** Citizenship and Computer Schools.

**E-learning:** One of the forms of distance learning. In general, there are no clear conceptual boundaries for this term. However, the prevailing idea within the corporate world – where the term emerged and is strongly sustained – is that of any type of learning which makes use of computers, and can be either synchronous or asynchronous.

**Electronic Government:** The use of Information and Communication Technology in the internal processes of government, and the delivery of the State’s products and services both to citizens and industry.

**Electronic mail:** A network service which allows users to send and receive messages speedily by means of electronic communication systems. This term is mainly used to name the system which provides this service on the Internet.

**Electronic support:** The screen and its games provide emotional support which, despite not being equal to personal support, can assist and lessen anxiety and anguish.

**E-mail:** Electronic mail.

**Entomology:** The scientific study of insects (*Longman Dictionary of Contemporary English*).

**Exoskeleton:** The external skeleton that covers the body of insects and other arthropods, also known as integument. It is formed by a series of layers.
**F**

**FBDG**: Food-Based Dietary Guidelines.

**Feedback**: Reaction and response; implies a “coming and going”.

From the social and psychological point of view, it is a process of sharing observations, concerns and suggestions, with the purpose of compiling individual or collective information, in order to attempt to improve the performance of an organization or of any group composed of human beings. For continuous improvement to be possible, feedback must be multidirectional.

**Flow zone**: A psychological zone in which difficulties exist in keeping with a player’s skills and in which players appear to move fluidly, without hindrance, according to the demands and activities which arise in the game.

**FNS**: Food and Nutrition Security.

**Free software**: Software denomination which allows users to use the product freely; once obtained, it can be freely used, copied, analysed, modified and redistributed.

**FTD**: Food Transmitted Diseases.

**Full saturation**: Total coverage of target population.

**G**

**GAFI**: Membership Management (BPS, State-owned pension fund).

**Georeferencing**: The positioning which defines an object’s location in terms of map projections or coordinates. It is a process used in Geographic Information Systems.

**Globalization**: A basically economic process which consists in the growing integration of different national economies into one single worldwide capitalist market.

**Google**: A company based in the United States, whose principal product is the search engine of the same name.

**H**

**Hardware**: Computer equipment used to operate software programmes. In consists in tangible elements such as the cabinet and contents of a computer and the peripheral devices (screen, keyboard, mouse) connected to it.

**HHRR**: Human Resources.

**Hypobody**: The experience of having a restricted body in the context of opportunities for expanding it (ubiquity, multitasking, etc.) which the new technology offers.

**I**

**IADB**: Inter-American Development Bank.

**IBM**: A multinational technological services enterprise.

**ICESCR**: International Covenant on Economic, Social and Cultural Rights.

**ICT**: Information and Communication Technology.

**IFD**: Teacher Training Institute.
IKS: Information & Knowledge Society.

Immersion: Refers to the feeling of entering another world, with different parameters; a different reality.

Information Society: A society in which the creation, distribution and manipulation of information are a significant part of its cultural and economic activities. Information Society is believed to be the successor to industrial society.

Internet: Worldwide, decentralized computer network formed through direct connections between computers by means of a special communication protocol.

IOM: International Organization for Migration.

IPA: “Artigas” Teacher Training Institute.

L

Larva: (plural: larvae) An animal in a state of development, after leaving the egg. It is capable of feeding itself, but has not yet acquired the shape and organization typical of adults of the species.

LATU: Technological Laboratory of Uruguay. It is a non-State quasi-public entity.

Learning object: A digital information entity developed for the generation of knowledge, skills, attitudes and values, and which makes sense in terms of the individual who uses it. It contains at least the following: content, learning activities and a context. It can include multimedia elements in order to facilitate its reuse, interfunctionality, accessibility and duration.

M

MDGs: Millennium Development Goals.

MEC: Ministry of Education and Culture.

Mesh network: An XO resource which allows computers to interconnect without necessarily being connected to the Internet. In this way, an intranet of XO users can be formed.

Metamorphosis: A biological process by which an animal physically develops after birth or hatching, involving a conspicuous and relatively abrupt change in the animal’s body structure through cell growth and differentiation (Wikipedia).

MIDES: Ministry of Social Development.

MIEM: Ministry of Industry, Energy and Mining.

MIT Media Lab: Also known as ‘Media Lab’; it is a department of the School of Architecture and Planning of the Massachusetts Institute of Technology. Devoted to research projects at the convergence of design, multimedia and technology, and has focused particularly on design and technologies that address social causes.
**M-learning**: Electronic mobile learning; a teaching and learning method which makes use of small, easy-to-handle mobile devices, such as mobile or cellular telephones, electronic diaries, TabletPCs, PocketPCs, iPods and any hand-held device which provides some form of wireless connectivity.

**MP3**: Compressed digital audio file format in which music is often stored.

**MTSS**: Ministry of Labour and Social Security.

**Network**: A group of interconnected computers which share programmes, information, communications or peripheral devices.

**NGO**: Non-Governmental Organization.

**OLPC**: One Laptop Per Child. A non-profit organization which develops and provides Plan CEIBAL XO laptops.

**Omar Dengo Foundation**: Costa Rica. A private, non-profit institution, which has been managing and implementing national and regional projects in the field of human development, educational innovation and new technology since 1987.

**Online**: Something is online if it is connected to a network or greater system (which is, implicitly, the line).

**OSE**: State Waterworks.

**PAHO**: Pan American Health Organization.

**PC**: Personal computer.

**PDA**: (Personal Digital Assistant) A hand-held computer on which many of the functions available on a desktop computer can be performed (watch films, create documents, play games, e-mail, surf the Internet, reproduce audio files, etc.), with the added advantage of being portable.

**PEAID**: Access to Digital Information Equity Programme.

**Peridomiciliary**: In the surrounding areas of a home.

**PNN**: National Naval Prefecture.

**PocketPC**: A pocket computer; also known as PDA (Personal Digital Assistant). A small computer, designed to take up very little space and be easily carried.

**Prospection**: Projection in time, seeking possible future scenarios.

**Pupa**: In insects whose metamorphosis is complete, this is the state prior to turning into adults.

**RAP CEIBAL**: Plan CEIBAL support network.

**Ritualize**: Endow something with ritual characteristics (from rite = custom or ceremony). A ceremony that is always performed in the same way, usually for religious purposes (Longman Dictionary of Contemporary English).

**RUTELCO**: Uruguayan Network of Community Telecentres.
Serotypes make it possible to distinguish between subspecies, which is essential in epidemiology. **Server**: Computer device similar to a desktop computer but usually more powerful. It is called a “server” because its main function is to provide different services, either to other devices and elements on the network, or to users, who are known as “clients”.

**SIMS**: The Sims is a strategic, social simulation video game. It is based on a creative philosophy in which scientific theories are applied to design life-simulators; which can involve a city, a planet, an ant hill, or as in “The Sims”, a neighbourhood.

**Site**: Pages related through an Internet server. A site is entered through a portal, or home page.

**Social exclusion**: In Social Science, marginalization or exclusion is a social situation involving economic, professional, statutory or political disadvantage, arising from difficulties encountered by a person or group when attempting to join any of the systems of social performance.

**Software**: Digital information stored in support systems or in the computer’s memory, which determines the type of tasks a computer can perform.

**SOHMA**: Naval Oceanography, Hydrography and Meteorology Service.

**SUEP**: Single Issuance and Payment System (BPS, State-owned pension fund).

**TabletPC**: A computer which is midway between a laptop and a PDA, on which it is possible to write by means of a touch screen. Users can use a stylus in order to work on their computer without a keyboard or mouse.
**Technology:** A number of theories and techniques which make it possible to make practical use of scientific knowledge.

**Traceability:** Refers to the possibility of following an object or animal through every step in a process chain, by electronic means. In Plan CEIBAL, it refers to the follow-up which LATU technicians perform with regard to XO computers.

**Transdisciplinarity:** This has two meanings. It can refer to holistic forms of research or can be used to mean a principle involving the unity of knowledge which transcends disciplines.

**Treasure Hunt:** Similar to WebQuest, but with a simpler structure.

**U**

**UdelaR:** University of the Republic of Uruguay.

**UruguayNet:** ANTEL’s national network.

**USL:** Uruguayan Sign Language, used by the deaf.

**UTE:** National Electricity Board.

**V**

**Vecindario:** (neighbourhood) an onscreen view which enables children, on their computers, to recognize their classmates and other users who are connected at the same time, and initiate contact with them.

**Vector:** An insect or animal that passes disease from one person to another (*Longman Dictionary of Contemporary English*).

**Virosis:** Any disease caused by a virus (*Wiktionary*).

**Virtual campus:** See: “Virtual learning environments”.

**Virtual learning environments:** Virtual areas in which different services and tools are provided, which allow participants to construct knowledge, cooperate and interact with others, amongst other features, whenever they need to do so.

**W**

**Web:** Also known as WWW (World Wide Web); a system of linked documents accessible over the Internet. With a web browser, users can view websites which contain written text, images, video films or other multimedia content, and surf between them using hyperlinks.

**Weblog:** Blog.

**WebQuest:** Guided research using resources which originate mainly on the Internet, which forces users to bring highly-developed cognitive skills into play, fosters cooperative work and student autonomy and includes authentic evaluation.

**WHO:** World Health Organization.

**Wi-Fi:** Wireless connection to the Internet.

**Wiki:** A website whose pages can be edited by numerous volunteers.
through a web browser. Users can create, modify or erase the same text, which they share.

**Wikipedia**: An encyclopaedia based on wiki technology. It is written collaboratively by volunteers, and allows most of the articles to be modified by any person with access through a web browser.

**XO**: A laptop developed by OLPC.

**YouTube**: A website which enables users to share digital video files over the Internet.
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