

PROMOTING RESEARCH IN EDUCATION & TECHNOLOGY 2015 - 2017

CENTER FOR RESEARCH
CEIBAL FOUNDATION



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Fundación **Ceibal**

CENTER FOR RESEARCH CEIBAL FOUNDATION

The Center for Research - Ceibal Foundation was created in January 2014 by Ceibal Center; the institution in charge of the first nationwide digital inclusion programme based on the One Laptop per Child model in Uruguay, namely Plan Ceibal. The center for research was established as an independent institution in relation to Ceibal Center with the aim of promoting excellence in research, capacity-building, knowledge transfer and international cooperation in the field of education and technology.

MISSION

Support excellence in research by developing and using scientific knowledge in the fields of social inclusion, education and technology.

OBJECTIVES

- Promote, develop and lead multidisciplinary research projects and programmes in the fields of digital technologies and education.
- Promote international cooperation with research centers, universities, governmental and non-governmental agencies and think tanks at national, regional and international level.
- Support research and evidence-based decision and policy-making, collaborating with government agencies, regulatory bodies and other relevant actors.
- Create mechanisms, strategies and programmes to support research in education and technology.
- Develop capacity-building, education and knowledge transfer in research that integrates social inclusion, education and technology.
- Support the development of technical, human and research capabilities for improving education in Uruguay.
- Provide educational training and lifelong learning opportunities for graduate and postgraduate students, academics and policy-makers.

LINES OF RESEARCH



**Social uses
of ICT and
digital
culture**



**Resources
and
platforms**



**New ways
of knowing,
learning,
teaching and
evaluate**



**Extended
learning
achievements**



**Educators
in the
digital age**

NOTE: The lines summarise the main fields of research in which the center focalizes its work. Likewise, these lines of research allow to determine the institutional priorities when funding projects or creating international partnerships.

ACTIVITIES

PROMOTING RESEARCH IN EDUCATION & TECHNOLOGY

DIGITAL INCLUSION FUND: EDUCATION WITH NEW HORIZONS

Institutions: Ceibal Foundation and the National Agency for Research and Innovation (Spanish acronym: ANII).

Duration: Initiated in 2015 (ongoing)

Objectives: The fund aims to promote excellence in research for the integration of digital technologies and innovation into education. So far, three calls for proposals were issued (2015 - 2016 - 2017) to fund original research contributing to the implementation and assessment of education and technology policies between national (Uruguayan) and international institutions.

These calls have allowed to strengthen national research in education and technology; create new scientific capabilities and promote knowledge transfer between national and foreign institutions; produce useful inputs for the adoption of public policies and facilitate the transfer and use of research findings for the benefit of the education system both in Uruguay and in participating countries.

2015 - 12 proposals were funded for a total amount of US\$ 400,000

2016 - 12 new research projects were funded for a total of US\$ 500,000. The objectives of the call also included human resource training (Master's degree scholarships).

2017 - The call has attracted 38 projects with an overall request for funding of US\$ 3,000,000, as well as a significant participation of international institutions.

CAPACITY-BUILDING, KNOWLEDGE TRANSFER AND TRAINING OPPORTUNITIES

EDTECH WINTER SCHOOL “EMERGING TRENDS IN THE STUDY OF EDUCATION AND TECHNOLOGY”

Institutions: Ceibal Foundation and the National Agency for Research and Innovation (Spanish acronym: ANII).

The following institutions also supported the initiative through different mechanisms: Departamento de Comunicación, Departamento de Educación (Universidad Católica del Uruguay), Universidad ORT, FLACSO Uruguay, Universidad de Montevideo and Facultad de Ingeniería (Universidad de la República), U.S. Embassy in Uruguay, Inter-American Development Bank, Fundación Sadosky, Deakin University.

The open day “Educación y Tecnología. Diálogos de Innovación educativa” was organized by Ceibal Foundation and Antel with the support of the Consejo de Formación Docente (Teacher Training Council), and New Pedagogies for Deep Learning - Uruguay Cluster.

Duration: 5 days (3rd to 7th July 2017)

Objectives: The Winter School aimed to create an exciting opportunity for postgraduate students and early career academics, presenting and discussing relevant EdTech policies and research for studying the future of education and technology, innovation and inclusion in the coming decade.

- Create a collaborative environment of discussion and analysis involving keynote speakers from the Massachusetts Institute of Technology - MIT, the Oxford Internet Institute, Berkman Klein Center -Harvard University, Tel Aviv University and the Deakin University -, along with early-career scholars and students.
- Present and exchange national and international research-based case studies.
- Create a long-term international academic network of excellence in education and technology (EdTech) based on multidisciplinary studies with different methodological perspectives.

37 participants from 12 different countries attended the EdTech Winter School - 76% of those live in South America, 16% in North America, 6% in Europe and a 3% in Central America.

NEW METRICS FOR EVALUATION AND ASSESSMENT IN LEARNING: TOWARDS INNOVATION IN LEARNING

Institutions: Ceibal Foundation with the support of INEE (National Institute of Evaluation in Education), ICT4V (Information and Communication Technologies for Verticals), and the Inter-American Development Bank - Education Division.

Duration: 7 days (11th - 15th April 2016)

Objectives: The purpose of the workshops was to share experiences and encourage analysis around the opportunities and challenges of using new metrics for assessment in learning.

- Promote analysis on the potential of data analytics and the promotion of new domains and approaches for the assessment of learning.
- Present and reflect on major international, regional and national experiences in this field.
- Promote the use, exchange and exploitation of data to generate broader perspectives on learning processes, and analyze the effectiveness of policies, programmes and strategies aimed at their development and improvement.
- Encourage collaboration and knowledge transfer between experts and institutions interested in new systems for the measurement and analysis of learning achievements.

COLLECTIVE PUBLICATION ON YOUTH AND DIGITAL CITIZENSHIP IN LATIN AMERICA

“JÓVENES, TRANSFORMACIÓN DIGITAL Y FORMAS DE INCLUSIÓN EN LATINOAMÉRICA”

Institutions: Ceibal Foundation, Digitally Connected (Berkman Klein Center for Internet & Society and UNICEF), Instituto de la Comunicación e Imagen de la Universidad de Chile, Facultad de Comunicación e Información de la Universidad de la República (Uruguay), GECTI de la Facultad de Derecho de la Universidad de los Andes (Colombia).

Duration: 18 months

Objectives: The publication aims to promote discussion and analysis on opportunities and transformations that digital technologies are causing on citizenship in Latin America, as well as to favour the exchange of experiences and better practices in the field.

RESEARCH IN EDTECH

Latest research projects developed and implemented
by Ceibal Foundation

360-DEGREE RUBRIC FOR 21ST SKILLS EVALUATION AND ASSESSMENT

Institutions: Ceibal Foundation, Faculty of Psychology, UDELAR (Uruguay), Microsoft S.A. Uruguay, Intel Corporation, New Pedagogies for Deep Learning Uruguay Cluster.

Duration: 24 months (ongoing)

Objectives:

- Design metrics and test an evaluation for individually assessing Creativity, Character; Critical thinking and Future thinking in two groups (6-8 and 10-12 year-old children).
 - Assess the different stages of development within each skill; simple process, complex thinking, thinking process that transcends the required skills.
 - Provide a methodology for applying and implementing the rubric: subject self-assessment; peer-assessment; teacher-assessment.
 - Adapt the evaluations and create an online assessment platform.
-

ICT USE FOR THE TRANSFORMATION OF EDUCATIONAL PRACTICES IN PUEBLA (MEXICO)

Institutions: Ceibal Foundation and Ceibal Center (Design for Change), SEP (Secretary of Public Education of the State of Puebla, Mexico), National Direction for Innovation in Education - UPAEP (Autonomous University of the State of Puebla).

Duration: 5 months (ongoing)

Objectives: Assess the impact of the programme for digital inclusion in preschool children of the State of Puebla; Implement a training programme using the methodology of Design for Change in order to assess its impact in teachers' perception of ICT use in the classroom.

COGNITION MATTERS IN URUGUAY

Institutions: Ceibal Foundation, the Cognitive Enhancement Foundation - Cognition Matters (Sweden), Faculty of Psychology, UDELAR (Uruguay).

Duration: 30 months (ongoing)

Objectives: The research aims to study the effects of basic cognitive skills stimulation in children learning outcomes and performance in Maths, working memory and visual-spatial reasoning.

The pilot study and main intervention were focused on an 8 week cognitive training programme using the game VEKTOR, developed by Cognition Matters.

EDUCATIONAL INNOVATION IN PUEBLA: THE VOICE OF THE ACTORS

Institutions: Education Futures LLC (U.S.A.) and the Secretary of Education (Puebla, Mexico).

Duration: 5 months

Objectives:

- Collect and analyse the perceptions of teachers, students and parents about the main achievements, challenges and necessary actions for improving education in the state of Puebla.
- Host collaborative exchange sessions using the World Café methodology around four thematic areas: New ways of knowing, learning, teaching and assessing; Teachers in the Digital Age; Social uses of ICT and digital culture; Resources and Platforms.
- Provide recommendations for future policy actions in the field of Education.

COMPARATIVE STUDY FOR THE ASSESSMENT OF DIGITAL SKILLS IN MEXICO AND URUGUAY

Institutions: Ceibal Foundation and Aprende Mexico with the support of the Ministry of Education of Chile, INEEd (National Institute of Evaluation in Education - Uruguay) and INEE (National Institute of Evaluation in Education - México). The project is funded by the bilateral fund México - Uruguay of AMEXCID (Mexican Agency for International Cooperation) and AUCI (Uruguayan Agency for International Cooperation)

Duration: 18 months

Objectives: The project aims to develop a common framework, methodology and tools for digital skills' assessment in students and teachers.

PROMOTING OPEN ACCESS IN URUGUAY

DIGITAL REPOSITORY OF CEIBAL FOUNDATION

Institutions: Ceibal Foundation and Ceibal Center

Duration: 24 months

Objectives: Ceibal Foundation's Institutional Repository was created with the aim of promoting free access and free use of scientific production and resources in the field of education, learning and the mediation of technologies as explained below.

- Integrate, preserve and promote access to and use of scientific and academic production related to the 1:1 model in Uruguay (Plan Ceibal) and abroad,
- Enhance the visibility of research, authors and the institutions that they work for,
- Bring the national and international community closer to the topics related to the research lines established by the Foundation,
- Promote the use of academic resources for the generation and transfer of scientific knowledge.

PARTICIPATION IN INTERNATIONAL STUDIES FOR EVALUATION & ASSESSMENT

INTERNATIONAL COMPUTER AND INFORMATION LITERACY STUDY -ICILS-

Institutions: Ceibal Foundation, Ceibal Center and International Association for Evaluation of the Educational Achievement (The Netherlands).

Duration: 36 months (ongoing)

Objectives: The International Computer and Information Literacy Study is an international standardized evaluation for assessing the student preparation and performance in the information age; to determine the factors that directly impact the learning and acquisition of digital skills; to obtain comparative data about the progression, development and performance in digital skills.

DQ GLOBAL INDEX - GLOBAL STANDARD FOR DIGITAL CITIZENSHIP

Institutions: Ceibal Foundation and DQ Institute¹ (Singapore)

Duration: 3 months

Objectives: The DQ Global Index is based on the “Digital Quotient” developed by DQ Institute in order to assess and generate preliminary data on digital skills’ performance in children from 8-12 years old. The survey allows to test the online behaviour, knowledge and skills for using technology effectively.

¹ The DQ Institute is formed by the DQ Coalition, specifically the Nanyang Technological University; Singtel; The World Economic Forum and the Varkey Foundation.

BUILDING TOOLS TO MEASURE THE USE OF ICT IN THE CLASSROOM

Institutions: The project is led by the International Development Research Centre (IDRC) and the Centre for Economic and Social Research (FEDESARROLLO), with the participation of the Ceibal Foundation Research Centre, Universidad del Norte (North University – Barranquilla, Colombia), the Ministries of Education of Colombia, Chile and Peru and the Ministry of Public Education of Mexico.

Duration: 24 months

Objectives: The project aims to build a regional institutional network for measuring the use of ICT in classrooms, developing indicators and using them for educational and social development in areas as teacher training, curriculum development and increasing social and gender equity.





Plan Ceibal

PLAN CEIBAL

Plan Ceibal (Programa para la Conectividad Educativa de Informática Básica para el Aprendizaje en Línea) was launched in 2007 -as both a social equity programme and an educational one with the mission of promoting social inclusion, bridging the digital divide in the country, and providing beneficiaries with technology and the necessary tools to effectively use it. The programme was inspired by the 1:1 model developed by Nicholas Negroponte in the Massachusetts Institute of Technology (MIT). Uruguay was the first country in the world to adapt and implement the programme at a national scale.

The programme's development responds to the need to address the digital divide in the country, provide access to digital technologies (devices and connectivity), enhance innovation in the educational system while also empowering children and teachers.

OBJECTIVES

The objectives of Plan Ceibal have gradually evolved, showing the capacity of the programme to respond to the challenges and needs in the integration of ICT across the educational system.

As a precondition for the effective integration of digital technologies, access to devices and broadband deployment were essential for the programme's future and sustainability.

This first phase focused in the following objectives: massive deployment of devices including all children and teachers in the public educational system, initially primary school followed by middle school (-preschool children were included in later stages-); development of internal processes for software and hardware maintenance and technical service; deployment of network infrastructure connectivity and high-quality videoconference equipment across the country.

The second phase aimed at securing the effective integration of digital technologies in the educational system, promoting teacher training and capacity-building, as well as providing resources and platforms that could enhance the learning and teaching practices within the classroom. The third and current phase is characterized by the development of new programmes based on digital skills, 21st century skills, deep learning, robotics, coding, research in education and ICT, digital inclusion among the elderly population, among others.

SUBJECT AREAS & PROJECTS

Besides providing access to information and communication technologies (devices and connectivity), Plan Ceibal has established several long-term projects aiming at effectively integrating digital technologies in the classroom in order to train teachers; to promote the introduction of innovative forms of learning, teaching and evaluating; to improve students competencies and abilities in the following subject areas:

- (a)** 21st century skills -New Pedagogies for Deep Learning-;
- (b)** Innovative training for problem solving -Design for change-;

- (c) Teaching English as a second language through videoconference -Ceibal in English-;
- (d) Robotics and computational thinking -LabTed-;
- (e) Teacher Development and training;
- (f) Educational online contents -Ceibal Digital Library and digital repositories-;
- (g) Online platforms for learning and evaluating -PAM (Adaptive Mathematics Platform in Mathematics)-, virtual classrooms -CREA and CREA2-, educational video games and apps;
- (h) Research in Education and Technology -Center for Research Ceibal Foundation-;
- (i) Social and digital inclusion -Aprender Todos-;
- (j) Digital inclusion of elderly population -Plan Ibirapitá-;
- (k) Learning to code (17 to 26 year-old people's) -Jóvenes a Programar-;
- (l) Learning Assessment and management tools for the education system -SEA Learning Assessment Systems Evaluation System and Electronic attendance system-.

INNOVATION

Plan Ceibal is characterized by having favoured innovation in the educational system in Uruguay. During its 10 years of existence, the programme has not only focused in the delivery of devices and Internet connectivity deployment, but has used information and communication technologies as a pillar for introducing new products, services and processes for providing education services as (a) online teaching and learning platforms, (b) digital educational resources, (c) virtual classrooms, (d) remote teaching and learning practices. Despite the relevance of using ICT for introducing new products or services in the education system, Plan Ceibal has also been able to reinvent itself by adopting and promoting new pedagogic models while also training teachers; introducing new forms of learning with or without technology that aim to prepare students for a digital and information-mediated society.

A whole ecosystem of innovative transformations has been created and shaped in Uruguay since the introduction of Plan Ceibal. Students and teachers are encouraged to use technology in innovative ways that are relevant for each particular context, to explore and experiment. Knowledge is built collectively through networks of schools, problem-based learning, labs of robotics, communities of

practices (mainly between teachers), national contests of innovation, among others projects. Although transformations in the education system and its translation into improved learning outcomes and performance require long-term institutional efforts, the pace of transformation and the opportunities of change appear to be extremely encouraging.

INTERNATIONAL COOPERATION

Plan Ceibal has provided international technical assistance and external cooperation services to several countries during the initial phases of their digital inclusion strategies such as: Angola, Argentina; Armenia; Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominica, Ecuador, Guatemala, Nicaragua, Rwanda and Suriname.

Since 2015, the Center for Research - Ceibal Foundation has promoted international cooperation, capacity-building and knowledge transfer in Latin America and North America, Europe and Asia, creating networks and joint-projects between specific areas of Plan Ceibal and research centers, governmental and non-governmental agencies, and think tanks worldwide.

PLAN CEIBAL & THE SUSTAINABLE DEVELOPMENT GOALS (SDGS)

Since its early beginnings, Plan Ceibal has aimed to improve education in Uruguay by providing access to digital technologies, bridging the digital divide and enhancing social inclusion. Its development and implementation is directly related to SDG 9.C of increasing access to information and communication technologies and SDG 4 of ensuring a quality and inclusive education for all.

To date, more than one million and a half devices have been delivered nearly reaching universal access among students and teachers (including pre-school, primary and secondary level school in the country), while Internet connectivity has been deployed in 99% of educational centers in the country. During the past ten years since the creation of Plan Ceibal, the programme has been a fundamental pillar of Uruguay's interinstitutional efforts to encourage the transition towards an information society and digital economy. As ICT permeate every aspect of society, access to digi-

tal technologies along with the necessary skills to effectively use them, are and will continue to be essential for citizens across the globe. Plan Ceibal has contributed to securing universal access to digital technologies in the country.

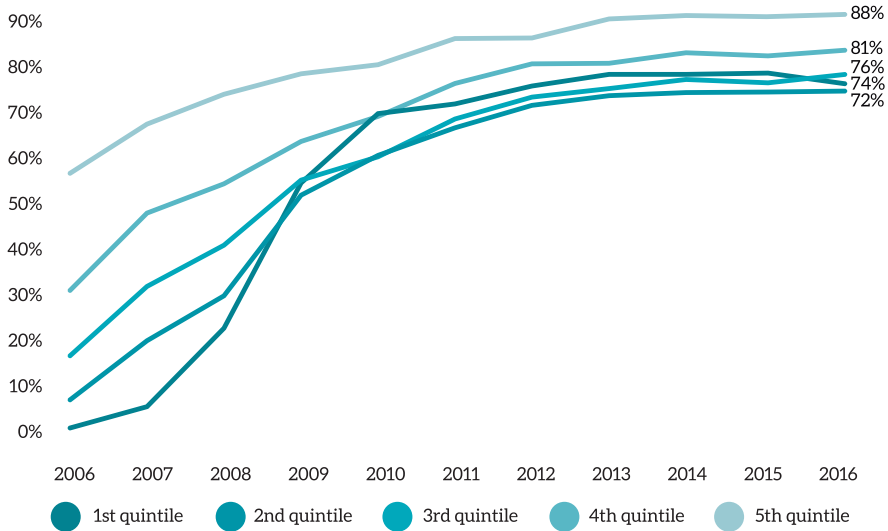
Furthermore and more specifically since 2010, Plan Ceibal advanced towards the introduction of specific and targeted projects for developing digital skills in learning and teaching practices in areas as STEM, Robotics, English Language, Computational Thinking, Coding, 21st Century Skills among others.

From an educational perspective, Plan Ceibal has used ICT as a platform for providing better educational services; online teaching and learning environments using new ways of teaching and learning; personalized and open contents for each relevant target group; innovative training and capacity-building; lifelong learning opportunities; collaborative environments and new ways of evaluating and assessing learning outcomes.

MEASURES & RESULTS

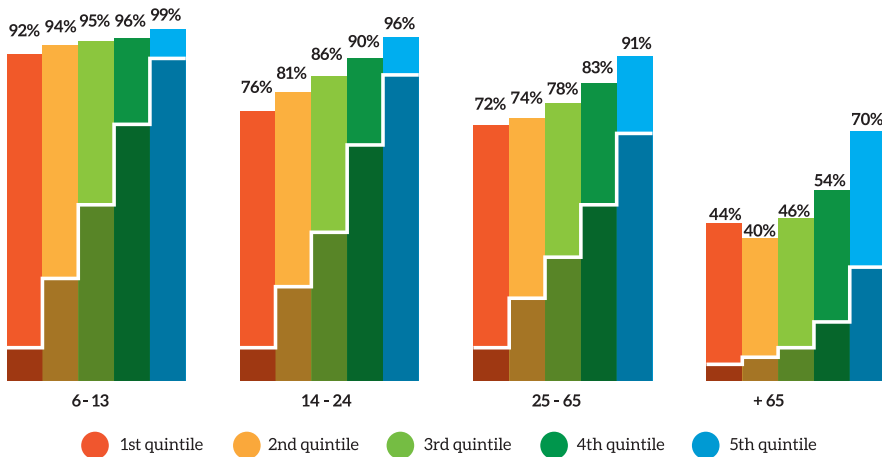
ACCESS TO A PC BY QUINTILES OF INCOME ACROSS THE COUNTRY

In percentage by person



2015: ACCESS TO A PC BY AGE GROUP, ACCORDING TO PER CAPITA INCOME QUINTILES

In percentage by person. Whole country.



DIGITAL DIVIDE

The digital divide in terms of access has been practically eliminated. In 2015, the divide in terms of access to a microcomputer was 1.2. The divide is calculated as the ratio between the percentage of those with access to a computer from the tenth decile in relation to the first decile².

Between 2008 to 2014, Plan Ceibal conducted Nationwide representative surveys aimed at 3° and 6° form children (8 and 11 years old), 6° form teachers, principals, and families.



8 out of 10 teachers use Plan Ceibal devices to set tasks in the classroom at least once a week.



7 out of 10 teachers set homework with Plan Ceibal devices at least once a month.



3 out of 10 students use intensively Plan Ceibal laptop in class (3 or more days per week). A trend that has continued since 2011.

2 Source: Household Survey, National Statistical Institute, Uruguay



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