



Fundación  
Ceibal

# EDUCATION SECTOR FUND: DIGITAL INCLUSION

## 2024 Report



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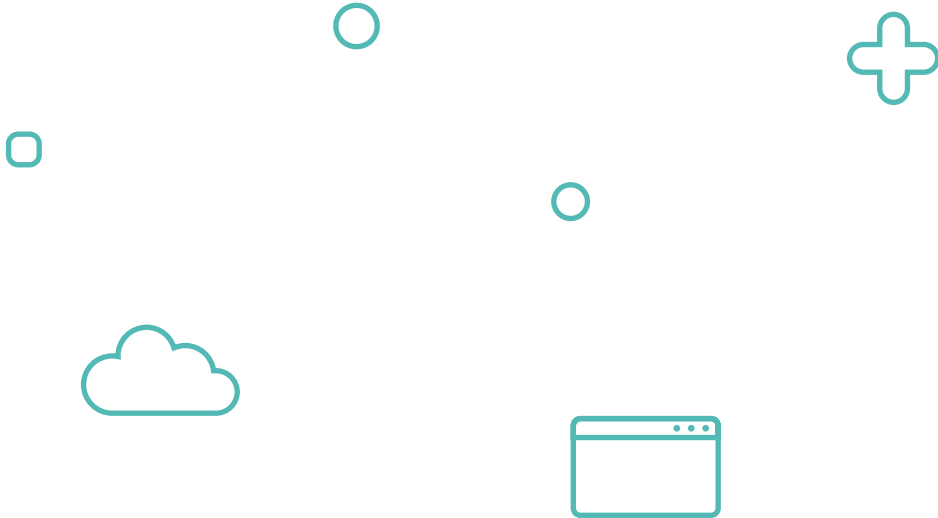
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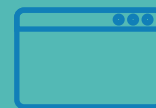
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1.



# FOREWORD

# FOREWORD



**María Florencia Ripani, PhD,  
Director, Ceibal Foundation**

The Education Sector Fund “*Digital inclusion: education with new horizons*” modality is an initiative that the Ceibal Foundation has been implementing together with Uruguay’s National Research and Innovation Agency (ANII) since 2015. It was created as an instrument for funding and promoting studies at the intersection of education, technology and innovation in order to foster research and the development of evidence-based public policies.

Digital technology is an essential resource for full social integration and the transformation of the world that we collectively envisage. We rely on it for the construction of knowledge, access to basic benefits, entry into the labour market and for substantive aspects linked to well-being. Digital technology has the potential to increase the intellectual and physical capacities of humans and is a key cultural resource for social mobility and inclusion. In the field of education, it is the subject of study in terms of its critical and creative use and its possibilities for social construction and transformation, and also as a fundamental resource enabling learning.

In this context, the purpose of the Education Sector Fund is to finance research projects that will provide original data on existing knowledge in the field of teaching and learning enabled by digital technologies that may be related to social or education aspects of Ceibal.

Research in the field of education and technology is essential, since the neglected areas are significant. This became apparent in the 2023 Global Education Monitoring (GEM) Report: Technology and Education<sup>1</sup>, published by UNESCO and presented at the Montevideo Meeting, organized by the GEM Report office and the Ceibal Foundation with the support of the Uruguayan Ministry of Education and Culture. The globally influential document warns about the lack of evidence in the world for the development of public policy. This is related to two fundamental issues: one is that research focuses on the richest countries, and the other is that much of the evidence we have is produced by private technology providers on the products that they themselves market. This reinforces the relevance of the Education Sector Fund in providing appropriate approaches to the integration of technology into education, considering the range of contexts in Uruguay, in touch with the world and promoting enriching projects that will contribute to public policy.

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<sup>1</sup> <https://fundacionceibal.info/GEMreport>

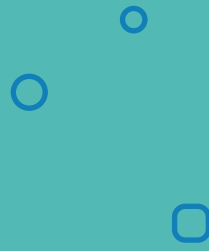
It should be borne in mind that the approaches to the integration of technology into education can be very diverse and that in order to identify the most powerful ones it is essential to produce evidence by means of research. This is the way to get data and hard evidence that will help make informed decisions that will have an impact and make it possible to build an innovative education system in the medium and long term based on evidence, for which it is necessary to have consistency in the terms and conditions and the assessment of the projects. In recent years, we have worked collaboratively at the Ceibal Foundation and ANII to effect improvements in the terms and conditions of the call. Priority lines were defined based on Uruguay's strategic policy needs and, in addition, in order to integrate the dimensions of practice and application into the analysis of the proposals and assess their potential benefit to public policy, the Application Committee was created in 2022 comprising representatives of the National Administration of Public Education (ANEP) and Ceibal. This committee's priority is precisely to assess the applicability of the projects submitted in each call and works alongside the Evaluation Committee, which is of an academic nature.

It is also a priority to systematize the calls, the selected projects and their contributions in order to analyze in perspective Uruguay's construction in terms of research in education, technology and innovation through the Education Sector Fund. This publication presents a systematization of the accumulated knowledge resulting from the projects selected by the Education Sector Fund in the calls between 2018 and 2023, following up on another document published by the Ceibal Foundation in 2018<sup>2</sup> which includes an analysis of the calls from 2015 to 2017.



<sup>2</sup> <https://fundacionceibal.info/InformeFSED2018>

2.



**RESEARCH  
FOR IMPROVED  
PUBLIC POLICY**



# RESEARCH FOR IMPROVED PUBLIC POLICY

The Ceibal Foundation believes strengthening research in conjunction with public policies is essential for making informed decisions that will help create innovative and resilient educational systems. In this regard, Leandro Folgar, President of Ceibal and the Ceibal Foundation, states that this issue, which currently involves the whole region, is one of the debates that the Ceibal Foundation promotes as part of its mission in collaboration with the national and international education and academic community. "The fact that Uruguay, as a country, has funds specifically assigned to conducting research with a focus on public policy contributes to the digital self-determination that we need. This calls for the general literacy of the population and advances in the use of artificial intelligence in education, which will lead to greater participation and higher levels of social development and citizen democracy."

**"The fact that Uruguay, as a country, has funds specifically assigned to conducting research with a focus on public policy contributes to the digital self-determination that we need."**



**Leandro Folgar**  
President, Ceibal and the  
Ceibal Foundation

In 2015, the Ceibal Foundation and the National Research and Innovation Agency (ANII) created the “Digital inclusion: education with new horizons” modality of the Education Sector Fund (FSED) for the purpose of funding research projects that will provide original data on existing knowledge in the field of teaching and learning enabled by digital technologies that may be related to social or educational aspects of Ceibal. This instrument is designed to fund and promote studies at the intersection of education, new technologies and innovation, with the aim of generating knowledge for the understanding of the opportunities and challenges they bring in a context of increasing massification. In this regard, Fiorella Haim, General Manager of Ceibal, stresses that “The challenge of strengthening research into suitable approaches to the integration of technology and education involves taking account of the range of contexts. Sector funds allow knowledge generation to inform public policy, and decisions to be adjusted to the real requirements, needs and opportunities of the sector.”

**“Sector funds allow knowledge generation to inform public policy, and decisions to be adjusted to the real requirements, needs and opportunities of the sector.”**



**Fiorella Haim**  
General Manager, Ceibal

Adriana Aristimuño, Sectoral Director of Educational Planning of the National Administration of Public Education (ANEP), stresses that the educational policy challenge is to introduce key technology suited to the needs of the education system. This calls for data and research: “It’s important to be up to date with what the latest research, even if still very incomplete, is telling us. The great opportunity of public policy with technology is the provision of low-tech and high-tech tools that were unthinkable before the pandemic in order to open up opportunities for equity and inclusion in education systems.”

The *Education Sector Fund: digital inclusion* modality is aimed at research groups from both national and international public and/or private institutions, and foreign-based organizations can also participate provided that they have a national counterpart. In this regard, the Education Sector Fund seeks to promote research of excellence that will have an impact on both the academic and educational world and on the implementation of related public policies. Its main tasks include promoting the generation of knowledge and scientific evidence that will guide decision-making in the field of education and digital technologies; promoting the creation of international networks and knowledge transfer; encouraging the adoption of new research methodologies; drawing attention to existing production, and transferring the findings of classroom research.

Regarding this fund, Flavio Caiafa, president of the National Research and Innovation Agency (ANII), underlines ANII's "pleasant, long experience" of offering research sector funds focused on education, and adds that "The fund with the Ceibal Foundation focuses specifically on digital learning and how to enhance it. The big challenge for education research is transfer. How to ensure that all knowledge is effectively transferred to the classrooms, to the students, is a challenge facing us in all developing countries."

Over the course of successive editions, the agencies sponsoring the Education Sector Fund: Digital Inclusion have introduced a number of modifications in order to optimize the tool based on the identified needs. Since its creation in 2015 until 2019, the Education Sector Fund had one single modality involving a set of lines and themes of significance to the Ceibal Foundation and whose implementation could result in proposals or inputs that can be applied or transferred to the national educational context. In 2020, action was taken to make the Education Sector Fund an instrument at the service of public policy. Among the changes made, two modalities were established in the call: Modality A, aimed at funding one or more priority issues for Ceibal in coordination with ANEP, and Modality B, aimed at funding projects related to one or more broad research lines of the Ceibal Foundation<sup>3</sup>.

**"It's important to be up to date with what the latest research, even if still very incomplete, is telling us."**



**Adriana Aristimuño**  
Sectoral Director of Educational Planning, ANEP

With the aim of continuing to improve this tool, linking research with application and thus making the Education Sector Fund an instrument at the service of public policy in education, an Applicability Committee (APC) was set up in the 2022 edition that was made up of representatives of ANEP and Ceibal taking part in the project selection and assessment process. The Applicability Committee, as a new actor, joined the assessment process in which the Agenda Committee (AC) and the Evaluation and Monitoring Committee (EMC) have been involved since the creation of the Education Sector

<sup>3</sup> Exceptionally, in the 2020 call, Modality B was funded by Canada's International Development Research Centre (IDRC) and was aimed at research projects in the region.

Fund. The AC, made up of members appointed by the boards of directors of ANII and the Ceibal Foundation, is the strategic body that defines the themes and fundamental lines and comes up with the general planning for each call, while the EMC is the technical-scientific committee of the Education Sector Fund, made up of five experts proposed by ANII and the Ceibal Foundation, approved by the ANII Board of Directors and validated by the CONYCIT (National Council of Innovation, Science and Technology).

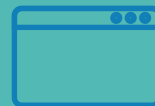
**“The big challenge for education research is transfer. How to ensure that all knowledge is effectively transferred to the classrooms, to the students, is a challenge facing us in all developing countries.”**



**Flavio Caiafa**  
President, ANII



3.



# SYSTEMATIZATION OF RESEARCH PROJECTS

# SYSTEMATIZATION OF RESEARCH PROJECTS

## 3.1. Approved research projects 2018-2023

This publication systematizes the projects selected in the Education Sector Fund calls between 2018-2023. During this period, 34<sup>4</sup> projects were approved: 7 in 2018, 6 in 2019, 6 in 2020, 6 in 2021, 5 in 2022 and 4 in 2023. These research studies address a wide range of topics, a diversity of objectives and a number of strategies and techniques that include quantitative, qualitative or mixed approaches. At the quantitative design level, quasi-experimental studies were submitted that sought to assess the impact of devices or innovations produced by the teams. At the qualitative design level, the studies are largely exploratory and descriptive, most of them being case studies. Despite the predominance of one of these approaches, researchers tend to include a combination of techniques: surveys, observations and interviews. In addition, they use participatory methodologies or action research focused on co-design among researchers, teachers and students of the education system.

A large proportion of the teams used their research for the creation and development - with their corresponding assessments or tests - of specific tools and devices for work in the classroom: video games for learning different skills, web platforms and laboratories, as well as training courses for teachers. The research processes also resulted in a set of resources that were made available for use by teachers and scientists in the area: assessment rubrics, results of the application of learning tests and various teaching materials. The creation of their own sites as well as the production of academic

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<sup>4</sup> In 2022, a project from the 2020 call was cancelled due to repeated non-compliance with the schedule and a lack of communication.



# 2018 Projects





# Applying digital technology to the didactic analysis of lessons in pre-professional teacher training practice

<b>Institution</b>	Consejo de Formación en Educación (Teacher Training Council), ANEP
<b>Head</b>	Silvia Umpierrez Oroño
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2018_1_150150
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Completed

This research sought to generate knowledge around the development of protocols for the didactic analysis of lessons based on the use of digital technologies that will allow for and/or complement pre-professional practice in a more accessible and inclusive way. 15 lessons were filmed in 4 secondary schools, and 37 units were drawn and used to design 9 work protocols which were made available on an open repository. The devices are valuable, as they contribute to building a low-risk, collaborative learning environment and are suited to the students' pace of learning. In addition, it is technologically feasible to incorporate them into a lesson or learning activity, and they are didactically suitable for group and/or interdisciplinary work.

***Access further information on the project and the resulting resources***



[https://fundacionceibal.info/  
AplicacionTecnologiaDigitalFormacionDocentes](https://fundacionceibal.info/ AplicacionTecnologiaDigitalFormacionDocentes)

# Creating and validating a set of instruments for assessing the development of computational thinking at the primary and upper secondary levels for Costa Rica, Mexico, Paraguay and Uruguay

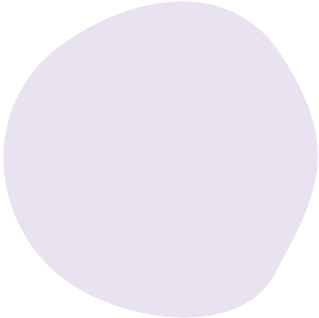
<b>Institution</b>	School of Economics and Business Administration, Udelar
<b>Head</b>	Juan José Goyeneche Capeluto
<b>Countries</b>	Uruguay - Costa Rica - Mexico - Paraguay
<b>Code</b>	FSED_2_2018_1_150624
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Completed

The purpose of this research was to devise a computational thinking learning test and its validation using a sample of primary and secondary education students from the 4 participating countries: Costa Rica, Mexico, Paraguay and Uruguay. In a quasi-experimental design, the work involved three phases. First, the aim was to explore the state of the art in the ways of integrating computational thinking into the curriculum, as well as the ways to assess it and the associated variables. The second stage involved developing the instrument: a video game set in a medieval world called “PCLandia” made up of 17 items of different difficulty levels. In the case of Uruguay, the third phase was a pilot test for 6th year primary school students.

***Access further information on the project and the resulting resources***



<https://fundacionceibal.info/InstrumentosEvaluacionDesarrolloPensamientoComputacional>



# Programme for the promotion of socio-emotional skills and coexistence in secondary education by incorporating ICTs: teacher training and impact assessment

<b>Institution</b>	School of Psychology, Catholic University of Uruguay
<b>Head</b>	Cindy Agnes Mels Auman
<b>Countries</b>	Uruguay - Chile - Belgium
<b>Code</b>	FSED_2_2018_1_150661
<b>Area</b>	Social Sciences / Psychology
<b>Status</b>	Completed

The objective of this research was to promote socio-emotional skills and coexistence in lower secondary education through in-service teacher training and the implementation of a workshop programme with the students in class. The development of an online platform for teachers involved two studies: a descriptive one for background information on the subject, and an exploratory one on teachers' perceptions and needs regarding socio-emotional training. In addition, a quasi-experimental design was necessary for assessing the impact on participants in terms of the implementation and assessment of the programme. It was possible to train 113 teachers and distribute a set of materials for raising awareness of the subject, as well as resources for work in the schools.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/PromocionHabilidadesSocioemocionales>



# Pilot project for a Living Sciences laboratory with “Do it Yourself” (DIY), “Do it with Others” (DIWO), and “Bring Your Own Device” [BYOD] technologies

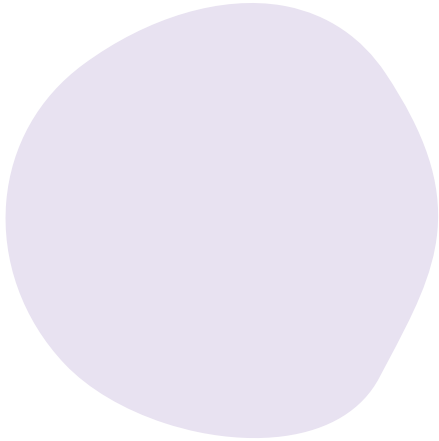
<b>Institution</b>	Consejo de Formación en Educación (Teacher Training Council), ANEP
<b>Head</b>	María Esmeralda Castelló Gómez
<b>Countries</b>	Uruguay - United States
<b>Code</b>	FSED_2_2018_1_150716
<b>Area</b>	Natural and Exact Sciences / Biological Sciences
<b>Status</b>	Completed

The main objective of this proposal was to promote the development of critical thinking skills among students and graduates of the *Consejo de Formación en Educación* (Teacher Training Council) teaching staff. One physical Living Sciences laboratory and two virtual laboratories, one in Cellular Biology and the other in Physiology, were created. In addition, a critical thinking test (HCTAES test) was administered using a quasi-experimental design of the pre-test/post-test type with a control group in order to assess the students' skills in research activities in laboratories. The descriptive statistics of these results showed that students stand out in the first dimension and have greater difficulties in the “assessment” dimension.

***Access further information on the project and the resulting resources***



<https://fundacionceibal.info/LaboratorioCienciasVivas>



# Promoting reading through stimulation in preschool: a digital approach

<b>Institution</b>	School of Psychology, Udelar
<b>Head</b>	Alicia María Kachinovsky Melgar
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2018_1_150717
<b>Area</b>	Social Sciences / Psychology
<b>Status</b>	Completed

This project focused on taking advantage of the recreational use of technology to stimulate pre-literacy skills. It looked into the validity of the "Luis, el cardenal" application, a Ceibal computer tool designed to stimulate the phonological awareness of pre-reading children and children learning to read. For this purpose, a quasi-experimental design was produced with active control and experimental groups, as well as a subsequent pre-post assessment, both involving 60 children from preschool level 5. It is apparent that the device is partially suitable for the assigned content, since there is only a statistically significant improvement for the intervention group in syllable segmenting.

***Access further information on the project and the resulting resources***



[https://fundacionceibal.info/  
PromoviendoLecturaEducacionInicial](https://fundacionceibal.info/PromoviendoLecturaEducacionInicial)



# Networks and digital inclusion: identifying and characterizing for the formation of communities that promote deep learning in public teacher training schools in Uruguay and Chile

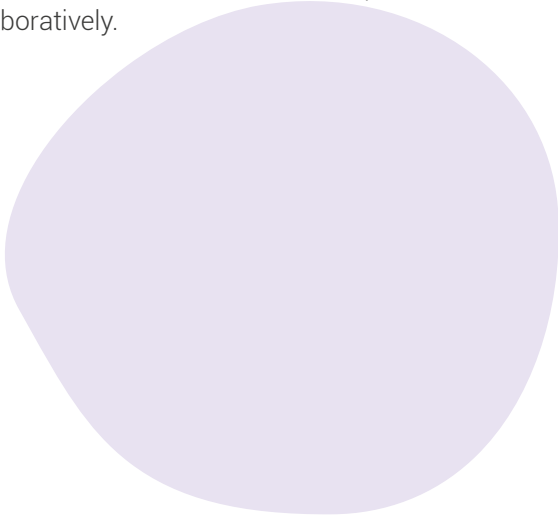
<b>Institution</b>	Institute of education, ORT University Uruguay
<b>Head</b>	Andrea María Tejera Techera
<b>Countries</b>	Uruguay - Chile
<b>Code</b>	FSED_2_2018_1_150773
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Completed

The objective of this research was to identify and characterize teacher training institutions in Uruguay and Chile that use digital inclusion as a means to form communities and promote deep learning. The exploratory-descriptive design was based on a comparative study of three cases in each country. The findings showed that both countries recognize the importance of using digital technologies in educational practices to promote learning and collaborative work, and they are highlighted as a major factor in training events. It was also found that it cannot be claimed that there are consolidated professional communities, but rather groups of people who work collaboratively.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/InclusionDigitalAprendizajeProfundo>



# Youth, digital skills and content gaps in Latin America (*HabLatam*)

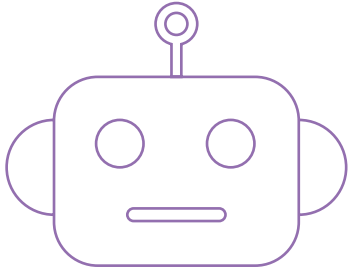
<b>Institution</b>	Institute of Communication and Image, University of Chile and School of Information and Communication, Udelar
<b>Head</b>	Lionel Brossi / Mauricio Nihil Olivera Cajiga
<b>Countries</b>	Uruguay - Chile - Argentina - United States - Colombia
<b>Code</b>	FSED_2_2018_1_150808
<b>Area</b>	Social Sciences / Communication
<b>Status</b>	Completed

The project sought to look into digital skills and online content gaps from the youth and the gender perspectives in order to scale, deepen and improve the quality of existing knowledge of and data on the subject. An in-depth exploration of digital skills in the formal and informal education of young people was carried out, and the different ways in which they learn and the sources they use were identified, together with existing online content gaps that need addressing. The work involved 107 young people from Argentina, Colombia, Chile and Uruguay. As a result, it was suggested that the lack of high-quality access (equipment and infrastructure) remains one of the main challenges. In addition, the digital practices observed tend to be associated with leisure, recreation and communication activities rather than the creation of content.

***Access further information on the project and the resulting resources***



<https://fundacionceibal.info/JovenesHabilidadesDigitales>



# 2019 Projects





# Learning Mathematics through Interaction with Peers and Intelligent Machines

<b>Institution</b>	Interdisciplinary Centre on Cognition for Teaching and Learning (CICEA), Udelar and Laboratory of Developmental Studies, Harvard University
<b>Heads</b>	Alejandro Maiche Marini / Elizabeth Spelke
<b>Countries</b>	Uruguay - United States - Brazil
<b>Code</b>	FSED_2_2019_1_156716
<b>Area</b>	Social Sciences / Psychology
<b>Status</b>	Completed

This project aimed to combine two approaches and assess whether together they can promote deeper, more effective learning of mathematics than each one on its own. The combination of two approaches to learning mathematics was assessed in 161 preschool and first-year students: social interaction through the use of games that improve intuitive understanding and motivation for learning, and individualized interaction with intelligent machines that adapt each child's performance level to the problems presented to them. The conclusion is that interaction between peers through specific games seems to be a more efficient format than the individual way - using tablets - in cognitively stimulating early mathematical skills, especially among underperforming children.

*Access further information on the project and the resulting resources*



[https://fundacionceibal.info/aprendiendo\\_matematicas](https://fundacionceibal.info/aprendiendo_matematicas)



# Data literacy. Skills for expanded digital citizenship

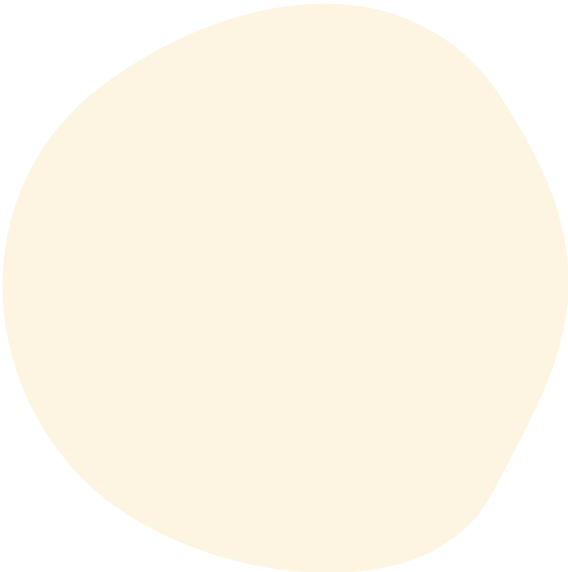
<b>Institution</b>	Centre for Technology and Society Studies (CETyS), University of San Andrés and Ceibal Global Learning Network, MEC
<b>Heads</b>	Carolina Inés Aguerre Regusci / Carolina Gruffat
<b>Countries</b>	Argentina - Uruguay - Chile
<b>Code</b>	FSED_2_2019_1_156905
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Completed

The project proposed a time-limited but high-impact intervention aimed at training in cognitive, meta-cognitive, and socio-emotional skills and looking into them using an action-research approach. Three kinds of skills were defined: technical (displays and databases), cognitive (creating new knowledge from data), and socio-emotional (collaboration, communication, and entrepreneurial initiative). The findings show that the intervention contributed to the development of technical and cognitive skills linked to critical thinking with data, especially in reading, interpretation, and identification of associations and patterns. To a lesser extent, it helped develop skills for building meaningful knowledge and leveraging digital citizenship.

***Access further information on the project and the resulting resources***



<https://fundacionceibal.info/AlfabetizacionenDatos>



# Technologies for learning to read and consolidating the reading habit

<b>Institution</b>	Fundación Edúcate Uruguay
<b>Heads</b>	Cecilia De La Paz
<b>Countries</b>	Uruguay - New Zealand - Spain - Chile
<b>Code</b>	FSED_2_2019_1_157010
<b>Area</b>	Humanities / Language and literature
<b>Status</b>	Completed

Through the development of a self-sustaining learning ecosystem, this action-research sought to improve the reading practices of children in rural schools following a diagnosis that students prefer paper books to digital ones. Using a mixed design and complementarity of techniques, one of the objectives was to measure whether being part of the designed learning ecosystem produces changes in reading habits. It was concluded that after the experience the children continue to prefer the paper format, and, since motivation predicts reading effectiveness, the number of books available will affect their reading development.

***Access further information on the project and the resulting resources***



<https://fundacionceibal.info/TecnologiasparaelAprendizajedelaLectura>



# Design and assessment of the impact of a professional development programme in formative assessment (FA) for secondary education mathematics teachers

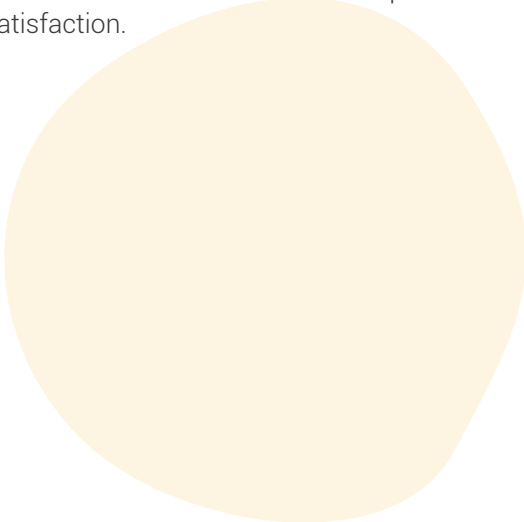
<b>Institution</b>	Department of Developmental and Educational Psychology, Catholic University of Uruguay
<b>Heads</b>	María Alejandra Balbi Broch
<b>Countries</b>	Uruguay - Spain
<b>Code</b>	FSED_2_2019_1_156641
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Completed

The objective is to incorporate formative assessment practices into the teaching strategies of secondary education mathematics teachers. For this purpose, a professional development programme (EPA Diploma) was designed that uses digital platforms as enabling tools. The first step involved a systematic review of professional development in formative assessment, followed by the integration of in-service teachers into the research team. As a result, 80% of the teachers remained on the programme throughout its implementation and voiced their high satisfaction.

*Access further information on the project and the resulting resources*



[https://fundacionceibal.info/  
EvaluacionProgramaDesarrolloProfesional](https://fundacionceibal.info/EvaluacionProgramaDesarrolloProfesional)



# Learning social skills for people with intellectual disabilities and people with normative development through digital technology

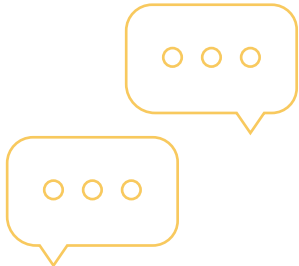
<b>Institution</b>	School of Health Sciences, Catholic University of Uruguay
<b>Heads</b>	María Del Mar Montoya Rodríguez
<b>Countries</b>	Uruguay - Spain
<b>Code</b>	FSED_2_2019_1_156062
<b>Area</b>	Social Sciences / Psychology
<b>Status</b>	Completed

The project sought to develop a digital intervention tool by using virtual reality to promote social skills among people with and without intellectual disabilities. The findings of the studies were that people with intellectual disabilities have greater difficulties in solving tasks that assess social skills than people with normative development, and even those with autism spectrum disorder. Regarding the impact of the intervention, participants who worked with the designed virtual reality application improved their scores on the perspective-taking variables.

*Access further information on the project and the resulting resources*



[https://fundacionceibal.info/desarrollo\\_habilidades\\_sociales](https://fundacionceibal.info/desarrollo_habilidades_sociales)



# Deep learning of Exact Sciences through inclusive online digital challenges

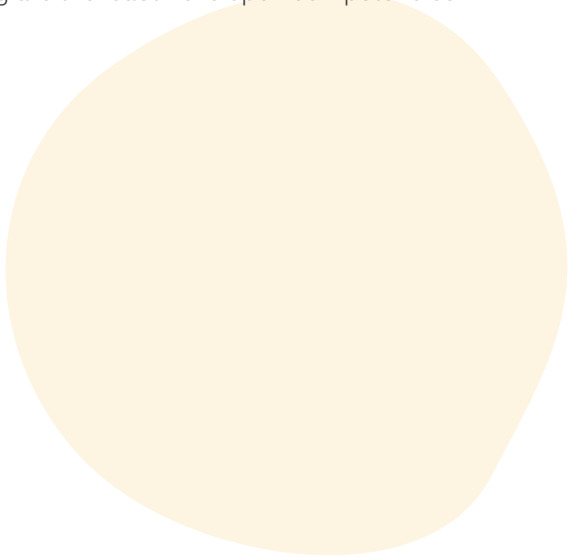
<b>Institution</b>	School of Chemistry, Udelar
<b>Heads</b>	Lucía Otero
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2019_1_155436
<b>Area</b>	Natural and Exact Sciences / Chemical Sciences
<b>Status</b>	Completed

This project focused on looking into how the implementation of digitally leveraged pedagogical practices based on deep challenges at the level of Exact Science teachers contributes to reinforcing more inclusive learning in the development of the 6 C-competencies (character, citizenship, creativity, critical thinking, collaboration, and communication) plus scientific competence (6C+1). It is apparent that teachers' perception of the development of the 6Cs+1 of secondary school students is greater than the actual development. Creativity and critical thinking are the least developed competencies.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/AprendizajeProfundoCienciasExactas>



# 2020 Projects



# Development of tools to support language teaching by using Artificial Intelligence techniques

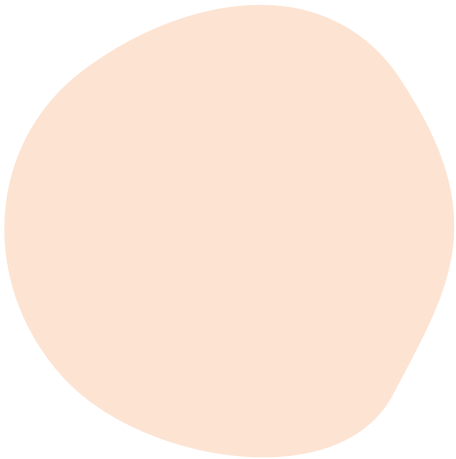
<b>Institution</b>	School of Engineering, Udelar
<b>Head</b>	Aiala Rosá Furman
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2020_1_163587
<b>Area</b>	Engineering and Technology / Electronic Engineering and Information Engineering
<b>Status</b>	Completed

This proposal aimed to develop a platform that would integrate a number of existing applications designed to teach English on the basis of Natural Language Processing (NLP) techniques in primary education. It also sought to study the feasibility of including them on the CREA platform, which implies inserting the work within Ceibal's pedagogical lines and CEI's (*Ceibal en Inglés*) theoretical-methodological foundations. A platform called "Cinacina" was developed that is extensible due to its modular design, helps integrate new activities in a simple way, and can be adapted to the teacher's needs.

***Access further information on the project and the resulting resources***



<https://fundacionceibal.info/HerramientasEnsenazaLenguas>





# Innovations for the teaching and learning of Natural Sciences enabled by digital technologies

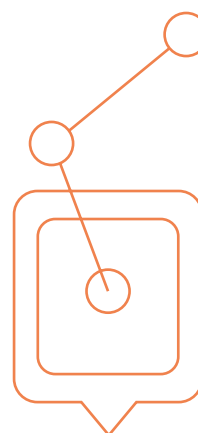
<b>Institution</b>	Consejo de Formación en Educación (Teacher Training Council), ANEP
<b>Head</b>	Gabriela Lourdes Varela Beloso
<b>Countries</b>	Uruguay - Costa Rica - Argentina
<b>Code</b>	FSED_2_2020_1_163647
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Monitoring phase

The research is part of a network of inter-institutional collaborative work involving Uruguay, Argentina and Costa Rica. The objective is to develop strategies and resources for teaching Natural Sciences in secondary schools with experimental activities in digital environments using Remote Laboratories (RL). This design-based project involves research into practice with an emphasis on the creation of knowledge aimed at the design, development and assessment of teaching sequences.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/AprendizajeCienciasNaturales>



# Digital technologies for teaching mathematics: usage analytics of the Adaptive Mathematics Platform, systematic mapping of available software and best practices for inclusive and digital mathematics

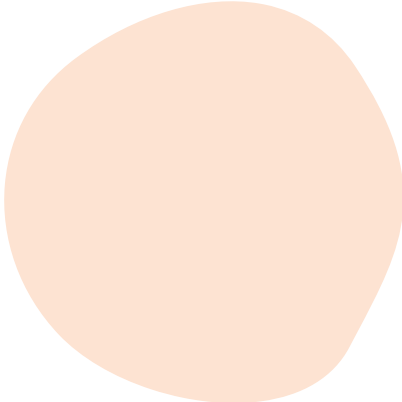
<b>Institution</b>	Institute of Education, ORT University Uruguay
<b>Head</b>	Cesar Eduardo Rodríguez Zidán
<b>Countries</b>	Uruguay - Spain
<b>Code</b>	FSED_2_2020_1_163598
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Completed

The purpose of the project is to identify, describe and analyze the use by and best practices of mathematics teachers who incorporate digital tools into their teaching. The broad objective involves three central aspects: the exploratory and correlational study of the usage analytics of the Adaptive Mathematics Platform (PAM) and CREA, a systematic mapping of available software for teaching mathematics and the study of the pedagogical strategies developed by teachers with digital mathematics tools. The qualitative survey shows that best practices must be based on teaching skills, that activities must motivate and focus on students, and that there must be collaborative work and planning supported by recreational dynamics.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/TecnologiaEnsenanzaMatematica>



# CETA, expanding the possibilities of tangible interaction in schools

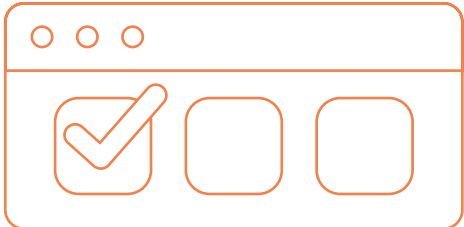
<b>Institution</b>	School of Information and Communication, Udelar
<b>Head</b>	Fernando González Perilli
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2020_1_163592
<b>Area</b>	Social Sciences / Communication and Media
<b>Status</b>	Completed

This research set out to explore the possibilities of implementing CETA (portmanteau of *Ceibal* and *Tangible*) in the classroom, assessing the adaptation of the teaching activities created, as well as the possibilities of teachers taking ownership of the resources provided. The use of econometric and predictive models was outlined for looking into the factors determining use and impacts on learning. It resulted in very concrete outputs, such as the new applications developed and significant contributions related to research capacities in participatory design of educational technologies.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/ceta>



# Monitoring and assessment of the use of educational platforms

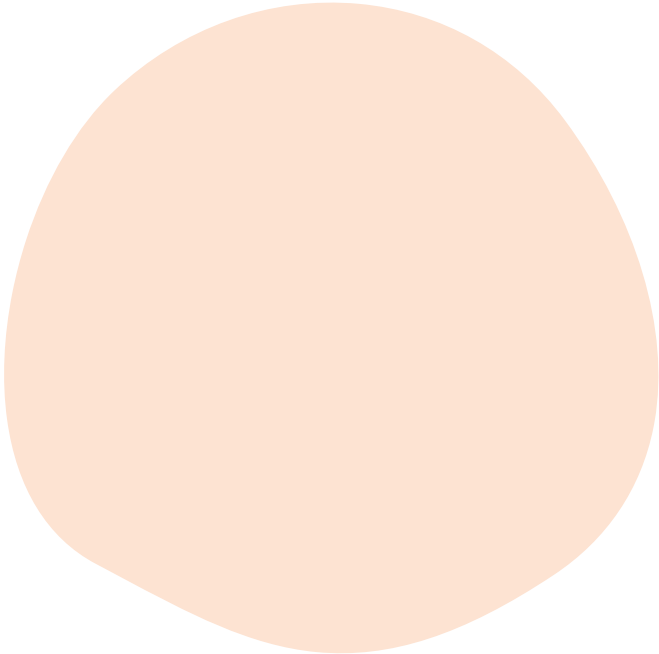
<b>Institution</b>	School of Economics and Administration, Udelar
<b>Head</b>	Natalia Andrea Da Silva Cousillas
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2020_1_163528
<b>Area</b>	Social Sciences / Economics
<b>Status</b>	Monitoring phase

The objective of this study is to develop statistical tools for the assessment and monitoring of educational platforms. There are three lines of action: the implementation of statistical and computational methods to turn platform usage data into information; the combination of information to characterize the role of online education in the pandemic; and the study of the effects of technology use on education quality and quantity indicators. There are plans for the creation of a CREA platform usage monitor with historical data, a set of platform usage indicators, and modelling to predict the results of adaptive English tests.

*Access further information on the project and the resulting resources*



[https://fundacionceibal.info/monitor\\_plataformas\\_educativas](https://fundacionceibal.info/monitor_plataformas_educativas)



# 2021 Projects



# Using teacher- and student-centred artificial intelligence to analyze inclusive, resilient teaching and learning processes

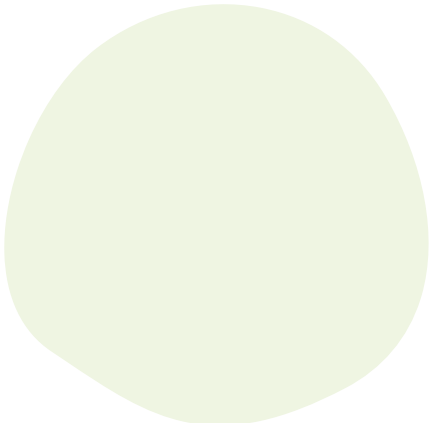
<b>Institution</b>	School of Engineering, Udelar, and Federal University of Rio Grande do Sul
<b>Head</b>	Eliseo Reategui / Regina Motz
<b>Countries</b>	Uruguay - Brazil
<b>Code</b>	FSED_2_2021_1_169701
<b>Area</b>	Natural and Exact Sciences / Computer and Information Sciences
<b>Status</b>	Monitoring phase

The project is based on the claim that artificial intelligence (AI), big data, and cloud computing are technologies that provide educational institutions with useful tools to maximize their resilience. However, the algorithms used exhibit a high level of opacity. This research seeks to develop an Explainable Learning analytics model for teaching processes that support teacher and student resilience. The aim is to co-create an open, inclusive learning analytics system, develop courses and various formats for teacher training, and create educational materials and a community to discuss the subject.

***Access further information on the project and the resulting resources***



<https://fundacionceibal.info/IAProfesoryEstudiante>



# Study and development of alternative interfaces between people and electronic devices

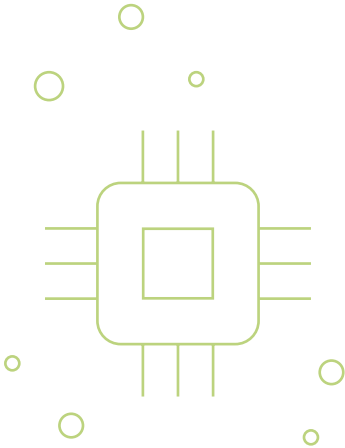
<b>Institution</b>	School of Engineering, Udelar
<b>Head</b>	Pablo Sebastián Pérez Nicoli
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2021_1_170937
<b>Area</b>	Engineering and Technology / Electronic engineering and information engineering
<b>Status</b>	Monitoring phase

This project seeks to design and build alternative interfaces that will allow the user to control technological devices such as computers and mobile phones, validating the prototypes created with students from Primary School N°20. This applied research involves two hubs: making these interfaces with good functionality standards but reducing cost, size and energy consumption; and promoting the learning of electronics and programming. Examples of simple alternative interfaces are implemented using the micro:bit programmable board provided by Ceibal to children and adolescents in the Uruguayan education system.

### *Access further information on the project and the resulting resources*



<https://fundacionceibal.info/InterfacesAlternativas>



# Global Network Medals, a gamified learning ecosystem for developing crosscutting skills in the classroom

<b>Institution</b>	Interdisciplinary Space, Interdisciplinary Centre for Open Digital Education, Udelar
<b>Head</b>	Ana Corbacho
<b>Countries</b>	Uruguay - Brazil
<b>Code</b>	FSED_2_2021_1_170206
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Completed

The research seeks to study the potential of Global Network Medals as an effective tool for the development of crosscutting skills in primary education students. Quantitative data are analyzed related to Ceibal platform usage, about income, medals awarded, the most popular medals, the most widely addressed skills and dimensions. This research is expected to result in suggestions for the improvement of the Global Network Medals tool, highlighting its potential for dissemination and use throughout Primary Education.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/MedallasRedGlobal>



# Megafauna 3D: open multimedia resources for science education and the conservation of the natural heritage

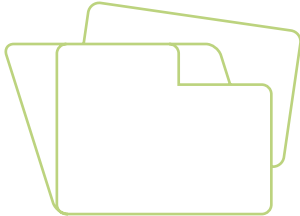
<b>Institution</b>	School of Sciences, Udelar
<b>Head</b>	Richard Alfredo Fariña Tosar
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2021_1_170843
<b>Area</b>	Natural and Exact Sciences / Earth Sciences
<b>Status</b>	Monitoring phase

This educational project seeks to promote the dissemination of and access to South America's paleontological heritage through 3D models and replicas of fossils. It involves an expansion of the Megafauna 3D project and producing multi-platform and multimedia educational materials focusing on the teaching of natural sciences and natural heritage for use in primary and secondary schools. This applied research proposes the development of prototypes and the production of support materials, and promotes interaction with physical material and face-to-face activities.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/megafauna3D>



# Study and development of child-robot interaction in the preschool classroom: improvements in the design of RoboTito to increase its insertion and ownership

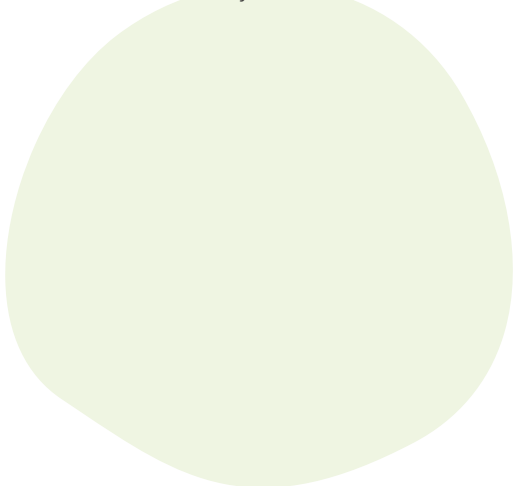
<b>Institution</b>	Interdisciplinary Centre on Cognition for Teaching and Learning, Udelar
<b>Head</b>	Ewelina Bakala
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2021_1_169697
<b>Area</b>	Natural and Exact Sciences / Computer and Information Sciences
<b>Status</b>	Monitoring phase

The objective of this project is to redesign the child-robot interaction proposed by RoboTito, a tool already developed, so as to adjust it to the cognitive, perceptual, and motor skills of children as well as the needs of educators. To develop the new version of the robot, the end users (students and educators) are involved in the design process from the beginning, which includes the assessment of the current robot (usability tests, ergonomic assessment, peer tutoring), defining improvements (interviews, brainstorming, drawings) and assessment of prototypes (field studies, video analysis, observation sheets, usability tests).

***Access further information on the project and the resulting resources***



[https://fundacionceibal.info/interaccion\\_ni%C3%B1o\\_robot](https://fundacionceibal.info/interaccion_ni%C3%B1o_robot)



# Institutional management of a blended curriculum. Case studies in Uruguay's secondary education

<b>Institution</b>	Latin American School of Social Sciences Uruguay and Universidad de la Ciudad de Buenos Aires
<b>Head</b>	Valeria Odetti / José Miguel García Martínez
<b>Countries</b>	Uruguay - Argentina
<b>Code</b>	FSED_2_2021_1_170300
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Completed

This exploratory and descriptive study of a qualitative nature sought to look into the curriculum management strategies developed by the management teams of six secondary schools in order to implement the blended modality in the context of the pandemic. Face-to-face and online time and space management decisions were studied, as well as curricular decisions linked to the didactic organization of the contents and the communication dynamics between teaching teams, teachers with students, and students with each other. The research resulted in two maps with the main components of the institutional management of a blended curriculum and the pedagogical management of this kind of curriculum.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/CurriculoHibrido>



# 2022 Projects

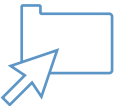


# Educational trajectories of Uruguayan students: providing information to help schools monitor them

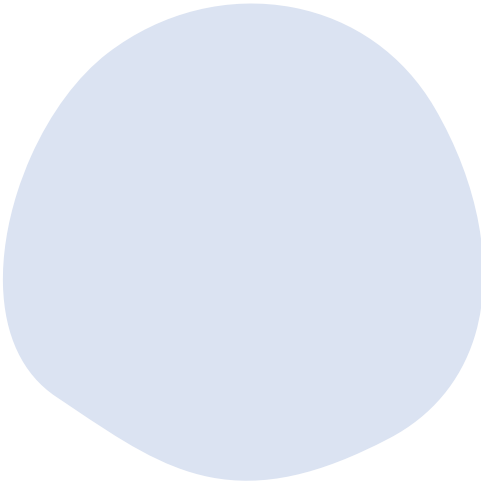
<b>Institution</b>	National Institute of Educational Assessment
<b>Head</b>	Jennifer Viñas Forcade
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2022_1_174471
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Monitoring phase

This research proposes three core objectives: to characterize the educational trajectories of students who took the Aristas test in their third year of secondary education in 2018 at public institutions; to identify the trajectories that imply a greater risk of disengagement; and to produce useful indicators and tools to monitor these trajectories. Its design involves three phases: first, a qualitative survey of different education stakeholders; a second stage to analyze quantitative data on student trajectories; and, thirdly, feedback and training events for education stakeholders in the use of the resulting indicators.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/TrayectoriasEducativasEstudiantes>



# Digital barriers: the challenges of the AcreditaCB test for adults

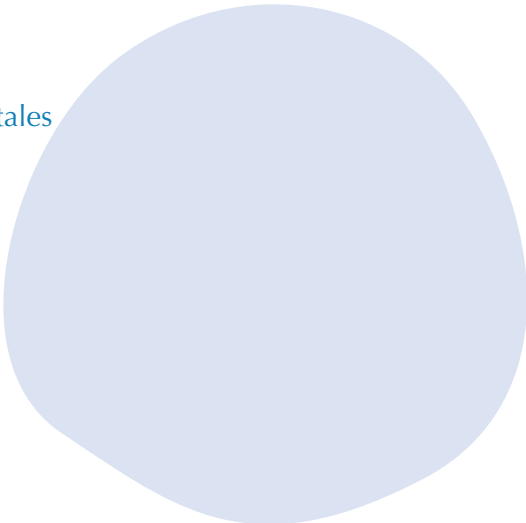
<b>Institution</b>	Homoludens Worker Cooperative
<b>Head</b>	Marcelo Adrián Morales Pignatta
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2022_1_174530
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Monitoring phase

This research is part of an educational policy that seeks to encourage the completion of lower secondary education in Uruguay by people over 21 years of age. It seeks to provide detailed insights into the barriers facing the AcreditaCB accreditation test's target population since, as it is an online exam, it involves digital skills that are not clarified by the test, which assesses: reading comprehension, problem solving, and text production. The project proposes the design and administration of a questionnaire to assess the digital skills of the candidates, and the findings are verified through a performance measurement program. The expected outputs are a characterization of the main barriers to digital inclusion and a list of key skills for passing the test.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/BarrerasDigitales>



# Educational continuity through a productive blended ecosystem

<b>Institution</b>	Educate Uruguay Foundation
<b>Head</b>	Cecilia De La Paz
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2022_1_174552
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Monitoring phase

The project focuses on adolescents living in rural areas and seeks to contribute to the protection of their educational trajectories by generating a blended teaching-learning ecosystem enabled by technology where the vocational development of young people is linked to the local productive context. It proposes an action-research design that takes the point of view of the subjects from the interpretive approach. Different techniques are intertwined depending on the objectives (documentary survey, administration of a questionnaire to young people, mapping of companies, sectors and farms in the area) and the pilot implementation of the resulting ecosystem will be assessed.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/ContinuidadEducativa>



# Standardized national test for the early assessment of language and mathematics competencies: a key to supporting educational trajectories

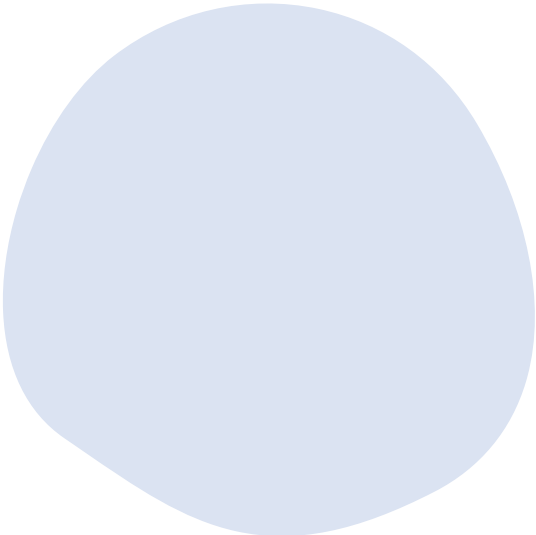
<b>Institution</b>	Interdisciplinary Centre on Cognition for Teaching and Learning, Udelar
<b>Head</b>	Camila Zugarramurdi Garcia
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2022_1_174584
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Monitoring phase

The objective of this research is to offer a standardized national test for the digital, individual, free, and classroom-applicable assessment of early language and mathematics competencies for children in preschool grade 5 and first year of primary education in public schools in Uruguay. The plan is to standardize two existing tests, "Lexiland" and "PUMA". The project also proposes the psychometric analysis and adaptation of shorter versions of both tests, as well as stratum benchmarks (establishment of a standard), an online platform for posting results, and training teachers in the cognitive basics of learning to read and write and mathematics, the use of "Lexiland" and "PUMA", and the interpretation of results.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/PruebaNacionalEstandarizada>





# Komikan Environment: integrating digital games in the classroom to promote computational thinking and cognitive functions

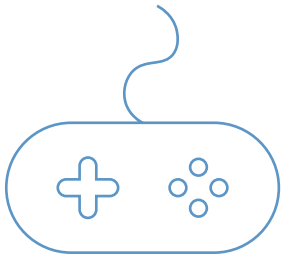
<b>Institution</b>	School of Chemistry, Udelar
<b>Head</b>	Marcela Cecilia Mena Rey
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2022_1_174595
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Monitoring phase

This research seeks to enhance the work carried out with Komikan, a board game that requires the use of cognitive and metacognitive skills. A Komikan Environment is implemented on a Ceibal-compatible platform with content on a board designed as a space for learning mathematical principles, in addition to challenges related to computational thinking. The plans include a server for storing the participants' results in order to produce a database that will reflect performance in the tested skills and can be made available for the development of broader and more inclusive learning methodologies.

*Access further information on the project and the resulting resources*



<https://fundacionceibal.info/EntornoKomikan>



# 2023 Projects



# Co-design of teaching and learning strategies with the inclusion of digital technologies in STEM

<b>Institution</b>	INET, Consejo de Formación en Educación (Teacher Training Council), ANEP
<b>Head</b>	Patricia Añon
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2023_1_179313
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Starting

This project focuses on research into and application of teaching and learning strategies in blended STEM teacher training courses integrating digital technologies. It presents co-design, with a focus on collaboration among researchers, educators, and students as a means of modifying educational practices and rising to challenges in STEM learning. The proposal addresses techno-scientific practices and highlights the integration of digital technologies for diversifying teaching methods, promoting imagery, and encouraging active, student-centred learning.

## Dr. Simon says: an environment for learning physics by integrating computational thinking, sensors and games

<b>Institution</b>	School of Sciences, Udelar
<b>Head</b>	Arturo Carlos Martí Pérez
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2023_1_179226
<b>Area</b>	Natural and exact sciences / Physical Sciences
<b>Status</b>	Starting

This research aims to develop a physical-computational videogame environment associated with a set of activities and resources, programmable boards, sensors and robotics kits for the purpose of teaching kinematics and contributing to the development of scientific and computational thinking tools. The resulting device will be accessible from a browser and will make it possible to save each student's progress and share it with their teacher. The assessment of learning acquired by the students is charted by contrasting it with that acquired in traditional lessons.

# Automatic correction of texts in English written by students of the Uruguayan education system

<b>Institution</b>	School of Engineering, Udelar
<b>Head</b>	Luis Hernán Chiruzzo Alonso
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2023_1_179355
<b>Area</b>	Engineering and Technology / Electronic engineering and information engineering
<b>Status</b>	Starting

The objective of this project is to develop an automatic correction tool for texts produced by secondary school students of English with a focus on spelling and syntax in order to relieve the teacher of this work and allow them to focus on other text-related aspects. For this purpose, an English text corpus with material produced by students and a corresponding correction rubric will be compiled and annotated. Artificial intelligence models will be created that will detect mistakes, propose corrections and produce feedback for new texts.

# STEAM literacy and its inclusion in the secondary education classroom

<b>Institution</b>	IPA Consejo de Formación en Educación (Teacher Training Council), ANEP
<b>Head</b>	Gabriela Lourdes Varela Belloso
<b>Countries</b>	Uruguay
<b>Code</b>	FSED_2_2023_1_179331
<b>Area</b>	Social Sciences / Education Sciences
<b>Status</b>	Starting

The purpose of this research is to design and implement contextualized and socially meaningful teaching sequences in STEAM pedagogies with resources for application in the classroom. The aim is to offer training for the design of teaching sequences to be undertaken by teacher training students in the blended modality doing their teaching practice in secondary education in coordination with their methodology teachers and teaching practice supervisors. This work also involves a nationwide and regionwide survey into the current status of teaching and learning with the STEAM approach.

# Projects with international funding selected in 2020

The 2020 Call of the Education Sector Fund: Digital Inclusion - Modality B was designed to fund projects or initiatives up to 5 months in duration that would provide concrete solutions to problems or needs in Latin American and Caribbean countries for the continuation of education during and after the COVID-19 pandemic. These projects received grants from the Ceibal Foundation through the Alliance for the Digitalization of Education in Latin America (ADELA) project, funded by Canada's International Development Research Centre (IDRC).

A total of 23 proposals were submitted, 10 of which moved on to the formulation phase and 5 were selected as beneficiaries of funding.

Code	Title	Scientific leader	Institution	Country
FSED_2_2020_1_163452	Best practices for the development of entrepreneurship and innovation skills in secondary school students through remote learning strategies in the context of the COVID-19 emergency.	Zúñiga Céspedes, Magaly	Omar Dengo Foundation	Costa Rica
FSED_2_2020_1_163610	The challenge of educational inclusion for the disabled through the use of digital tools	Morazán Lanza, Diana Leonora	Ministry of Education/General Directorate of Professional Development (DGDP)	Honduras
FSED_2_2020_1_163676	Guide to teacher training and school practice for digital competence in and design and production of OER.	Edel Navarro, Rubén	Mexican Network for the Development and Incorporation of Educational Technology	Mexico
FSED_2_2020_1_163677	Microlabs at Home: Multimodal Strategies for the Enrichment of Learning Processes in the Daily Lives of Children during and after the Pandemic	Cabrera Paz, José	José Cafam University Foundation	Colombia
FSED_2_2020_1_163650	Digital devices for the continuation of education in curricular units with high practical content.	Añón, Patricia	Teacher Training Council (National Administration of Public Education).	Uruguay

# 3.2. Analysis of the 2018-2023 calls

The collective analysis of the projects selected and developed over the six editions reveals some trends that consolidate the profile of the Education Sector Fund and its participants. It is noticeable that most of the research teams belong to national publicly-funded institutions, largely services of the University of the Republic (Udelar) of Uruguay and ANEP. Apart from that, half of all the implemented projects included foreign researchers from diverse origins participating together with the national teams, which positions the Education Sector Fund as an effective, far-reaching tool for the promotion of scientific communities. In this regard, the study of the projects shows that the teams use the allocated funds mostly to recruit human resources, whether they are members of the teams or international consultants.

The prevalence of the areas of social and human sciences, most of them Education Sciences, is also a constant throughout the editions, although the number of projects that are part of the natural and applied sciences began to increase after 2021, especially the initiatives in the areas of computer science and information engineering. When observing the themes addressed based on the priorities defined by the sponsoring organizations, it is harder to identify regularities due to the changes that were gradually made in the modalities of the successive calls. However, it is safe to say that in the six editions considered in this systematization, a third of the projects focus on the teaching-learning processes, with a range of pedagogical-technological innovations across the board.

**Figure 1. Evolution of Education Sector Fund modalities since 2015.**

2015 - 2019	Single modality		
2020	Modality A	The then Plan Ceibal + ANEP	Transitional modality
	Modality B	IDRC – Canada	
2021 - 2023	Modality A	Ceibal + ANEP	2021 new lines
	Modality B	Ceibal Foundation	2022 and 2023 redefine lines from 2021
			Same lines as Mod. A 2020

# Selection and assessment process

The process of selecting and assessing projects involves four stages: i) eligibility, ii) relevance and prioritization, iii) technical and applicability evaluation, and iv) final recommendations. Three committees have been involved since 2022: Applicability Committee (APC), Agenda Committee (AC), and Evaluation and Monitoring Committee (EMC).

The APC, created in 2022, is made up of representatives from ANEP and Ceibal and, as its name indicates, it evaluates the degree of applicability of the research (stage 3), as well as collaborating in the evaluation of the relevance and prioritization of the project profiles (stage 2).

The AC and the EMC have been part of the process since the creation of the Education Sector Fund. The CA is made up of members appointed by ANII's Board of Directors and Ceibal Foundation's Board of Directors, and is the body of a strategic nature tasked with defining the broad lines and themes of each call and establishing the overall planning for each call. It is responsible for assessing the relevance and prioritization of the project profiles and approving them – or not – for submission of the full projects (stage 2). It also makes the final recommendations on the funding of projects (stage 4) that have moved forward in the process.

The EMC is the technical-scientific committee of the Education Sector Fund, comprising five experts proposed by ANII and the Ceibal Foundation, approved by ANII's Board of Directors and ratified by CONYCIT. It participates in the technical evaluation of the projects and orders them on the basis of that assessment (stage 3).

**Figure 2. Selection and evaluation process for Education Sector Fund projects.**

<b>Stage 1 - Eligibility</b>		<b>Stage 2 - Relevance and prioritization</b>	
Project profile	Eligibility analysis (ANII)	Applicability Committee (APC) (Ceibal + ANEP)	Agenda Committee (AC) Approves Rejects
<b>Stage 4 - Final recommendations</b> Applicability Committee (APC)  Final recommendations on project funding		<b>Stage 3 - Technical and applicability evaluation</b> Applicability evaluation APC Project submission Technical evaluation Technical peer reviews Monitoring Committee (EMC)  Project rankings	

# Projects selected in the 2018-2023 calls

Since its creation in 2015 and until the 2023 call, a total of 285 projects were submitted to the Education Sector Fund, 69 of which were selected. More particularly, 34 projects were approved<sup>5</sup>, 29 were implemented, 4 are in their early stages, and 1 was cancelled<sup>6</sup> in the six years taken for the systematization in this publication. The analysis carried out below does not take into account the cancelled project, with 33 being the total number of research projects analyzed.

Table 1 presents the projects selected in the calls made between 2018 and 2023.

**Table 1. Number of projects submitted and approved in the 2018-2023 Education Sector Fund editions.**

Edition	1st phase - Proposal of ideas	2nd phase - Proposal of projects	Approved
2018	48	17	7
2019	43	15	6
2020	48	16	5
2021	Not applicable	14	6
2022	Not applicable	16	5
2023	12	10	4
<b>Total</b>	<b>151</b>	<b>88</b>	<b>33</b>

As regards their status, the projects can be in one of three phases: started, monitoring phase or completed. Currently, of the total of 33 projects, 4 are starting, 12 of them are in the monitoring phase and 17 have been completed already.

<sup>5</sup> This figure does not consider projects funded by Canada's International Development Research Centre (IDRC Canada) in modality B of the 2020 edition, which was exceptionally aimed at research projects in the region.

<sup>6</sup> In 2022, a project from the 2020 call was cancelled due to repeated non-compliance with the schedule and a lack of communication.



**Table 2. Status of projects in the 2018-2023 editions of the Education Sector Fund.**

Edition	Started	Monitoring phase	Completed	Total
2018	0	0	7	7
2019	0	0	6	6
2020	0	2	3	5
2021	0	5	1	6
2022	0	5	0	5
2023	4	0	0	4
<b>Total</b>	<b>4</b>	<b>12</b>	<b>17</b>	<b>33</b>

It must be pointed out that the different modifications introduced to the Education Sector Fund regarding its modalities implied changes to the project funding and implementation schedule. In this regard, between 2017 and 2019, projects had a minimum execution period of 12 months and a maximum of 24. In 2020, it was established that modality A would keep the same criterion, while modality B, funded by IDRC Canada and not considered in this analysis, allowed the submission of projects running as long as 5 months. Between 2021 and 2023, all projects submitted - whether in modality A or B - had a minimum duration of 8 months and a maximum of 24.

The following tables describe the duration - in months - of approved projects in terms of the changes introduced in subsequent editions of the Education Sector Fund.

**Table 3. Duration of projects in the 2018, 2019 and 2020 editions of the Education Sector Fund.**

Edition	Duration in months					Total
	12	15	16	18	24	
2018	2			1	4	7
2019	1		1		4	6
2020	1	1			3	5
<b>Total</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>11</b>	<b>18</b>

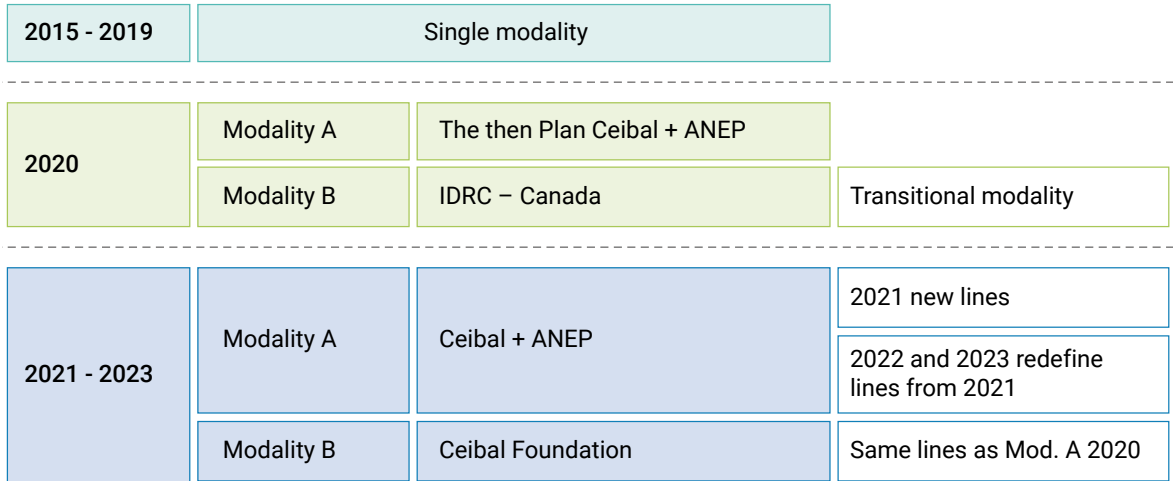
**Table 4. Duration of projects in the 2021, 2022 and 2023 editions of the Education Sector Fund.**

Edition	Duration in months						Total
	8	12	14	16	18	24	
2021	0	2	0	1	1	2	6
2022	0	1	0	4	0	0	5
2023	0	0	1	3	0	0	4
<b>Total</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>15</b>

Since the inception of the Education Sector Fund, the instrument has funded as much as 80% of the expenses of the initiatives, and the projects must have a counterpart that covers at least the remaining 20%. In the 2018 and 2019 editions, 12-month projects were allocated \$1,450,000 and 24-month projects \$2,900,000. In 2020, the budget in modality A remained the same as in previous years, and for modality B, which is not included in this analysis, a \$600,000 budget was allocated (IDRC Canada funding). In 2021, 2022 and 2023, the budget remained at \$2,900,000 for each project regardless of its modality.

Regarding the use of the funds received, it can be noted that of all the projects throughout the different editions, the three most funded areas are related to the recruitment of technical staff and consultants, promotion and dissemination. Of these three, the recruitment of technical staff is the area the funds are mostly allocated to. As the following graph shows, almost 80% of the projects allocate at least half of their financial resources to these recruitments. More specifically, 50% of the projects assign more than 70% of the funds to this area; almost 30% allocate between 50 and 70%, and just over 20% assign between 30 and 50% to technical staff.

**Graph 1. Percentage of funds projects allocate to recruiting technical staff.**



## Participating institutions

The Education Sector Fund establishes the possibility for project applications by national or foreign-based institutions. In the latter case, the foreign organizations must have a national counterpart. Research projects can therefore have one or two proponent institutions. In the six editions analyzed in this report, most of the projects – 28 – were submitted by one single national institution. The other five were submitted by foreign institutions—the Institute of Communication and Image of the University of Chile, the Laboratory of Developmental Studies of Harvard University, the Centre for Studies in Technology and Society of the University of San Andrés, the Federal University of Rio Grande do Sul, and the University of Buenos Aires—with a national counterpart.

A look at the national institutions supporting the projects (as the main institution or as a counterpart) shows that Udelar sponsors the most teams in all the editions: 17 of the 33 research projects. Another 6 projects are sponsored by other national universities (UCUDAL, ORT and FLACSO), 5 are endorsed by ANEP, 2 by the Educate Uruguay Foundation, 1 by Ceibal, 1 by the INEEd (National Institute of Educational Assessment) and 1 by the Homoludens Worker Cooperative.

**Table 5. Number of projects by national proponent institution. Education Sector Fund (2018-2023).**

Institution	2018	2019	2020	2021	2022	2023	Total
ANEP	2		1			2	5
UDELAR	3	2	3	5	2	2	17
UCUDAL	1	2					3
ORT	1		1				2
FLACSO				1			1
CEIBAL		1					1
Educate Uy Foundation		1			1		2
INEEd					1		1
Homoludens Coop.					1		1
<b>Total</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>33</b>

Apart from the proponent institutions, in the vast majority of cases, the research teams are made up of members from various institutions: in 23 of the 33 projects, the researchers are from at least two institutions, and 16 of these come from foreign institutions.

# Areas of knowledge and disciplines

Over the six editions analyzed in this publication, a larger number of projects in the areas of social and human sciences were implemented than those in the areas of natural and applied sciences, which include information sciences and computer engineering. Table 6 illustrates these trends: 24 projects fall into the former category and 9 into the latter. In addition, the number of research projects in social and human sciences is larger in all the years, except in 2021, when the approved projects in natural and applied sciences were twice as many, and in 2023, when the numbers were the same.

**Table 6. Number of projects by area of knowledge in 2018-2023 Education Sector Fund editions.**

Area and disciplines	2018	2019	2020	2021	2022	2023	Total
Social and human sciences	6	5	4	2	5	2	24
Natural and applied sciences	1	1	1	4		2	9
<b>Total</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>33</b>

An analysis of the main disciplines within the area of social and human sciences shows that out of a total of 24 projects, most of them (16) are related to education sciences, followed by psychology (4), communication and media (2), economics (1) and language and literature (1).

In the area of natural and applied sciences, 5 out of a total of 9 projects are related to applied science, computer science and information engineering, while there are 4 in natural sciences: 1 project in biological science, 1 in physical science, 1 in chemistry and 1 in environmental earth sciences.

# Priority lines and themes

The terms and conditions of the Education Sector Fund state that the projects must be registered within a stipulated set of core thematic lines, and also sets out a core of priority themes for each of them. These guidelines were modified throughout the editions as adjustments were introduced to the modalities.

In this regard, the Fund had one single modality in 2018 and 2019. The thematic lines that guided the projects in those two years were: A) New ways of knowing, learning, teaching and assessing. B) Educators in the digital age. C) Social uses of ICTs and digital culture. D) Expanded learning achievements. E) Resources and platforms.

If we analyze the distribution of the 13 projects from these two editions (7 approved in 2018 and 6 in 2019), we can see that the majority are registered in line A: New ways of knowing, learning, teaching and assessing.

**Table 7. Number of projects by thematic line in 2018 and 2019.**

	2018	2019	Total
New ways of knowing, learning, teaching and assessing	4	4	8
Educators in the digital age	1		1
Social uses of ICTs and digital culture	1	1	2
Expanded learning achievements		1	1
Resources and platforms	1		1
<b>Total</b>	<b>7</b>	<b>6</b>	<b>13</b>

In turn, if we break down the priority issues addressed by the projects within each line, we see that in the category that contains the most research projects, the proposed work is mainly around “cognition and meta-cognition” and “new pedagogies (deep learning) and technologies”.

**Table 8. Number of projects by priority issues in 2018 and 2019.**

Thematic lines	Priority issues	
New ways of knowing, learning, teaching and evaluating	Cognition and meta-cognition	3
	New pedagogies (deep learning) and technologies	3
	Self-learning and personalization	1
	Multi-learning environment	1
Education in the digital age	Initial training and use of technologies	1
Social uses of ICTs and digital culture	Practices of use and generation of knowledge	1
	Digital literacy, fluency and maturity	1
Expanded learning achievements	Effects on school learning	1
Resources and platforms	DIY Technologies	1
<b>Total</b>		<b>13</b>

The year 2020 saw the introduction of two modalities: A and B. A prioritizes the funding of projects in line with what was then Plan Ceibal and ANEP. In addition to this split, the thematic lines and priority issues were redefined in 2020 in relation to previous editions now contained in modality A: a) Digital society skills, b) Use of data and artificial intelligence, c) Digital inclusion, d) Innovation in teaching and learning, and e) Feedback and assessment. In this 2020 edition, 5 projects were implemented in modality A, and Innovation in Teaching and Learning was the topic of most of the projects (3).

**Table 9. Number of projects by thematic line in modality A in 2020.**

Thematic lines	2020
Digital society skills	
Use of data and artificial intelligence	1
Digital inclusion	
Innovation in teaching and learning	3
Feedback and assessment	1
<b>Total</b>	<b>5</b>

The 2021, 2022 and 2023 calls retained these thematic lines, but in 2021 they were moved to Modality B, aimed at Ceibal Foundation's broad lines. While Modality A maintained its objective of addressing priority issues of the then Plan Ceibal in coordination with ANEP, it proposed different thematic lines in 2021 from those established for 2022 and 2023. These three editions approved 15 projects, 10 in modality A and 5 in B.

**Table 10. Number of projects by thematic line in modality A in 2021.**

Thematic lines	2021
Online learning experiences of students in the public system	
Applied research projects	2
Teacher Professional Development	
Digital inclusion in secondary education: case analyses and exploration of teacher and student perceptions	
Digital divide in Uruguay: analysis and exploration of middle manager perceptions	
Blended curriculum proposals	1
Proposals promoting accessibility (learning difficulties and disabilities)	1
Analysis of cases of collaborative work in lower secondary education	
<b>Total</b>	<b>4</b>

**Table 11. Number of projects by thematic line in modality A in 2022 and 2023.**

Thematic lines	2022	2023	Total
Blended education	1		1
Competence-based curriculum		1	1
Promoting accessibility in education	1		1
STEAM teaching and learning		1	1
Use of data to support educational trajectories	2		2
Academic performance and assistance	Not applicable		
Artificial intelligence in education	Not applicable		
<b>Total</b>	<b>4</b>	<b>2</b>	<b>6</b>

Finally, as regards the 5 projects in modality B (2 in 2021, 1 in 2022 and 2 in 2023), 3 of them appear in the “innovation in teaching and learning” line, 1 in “use of data and artificial intelligence” and 1 in “feedback and assessment”.

**Table 12. Number of projects by thematic lines, Modality B in 2021, 2022 and 2023.**

Thematic lines	2021	2022	2023	Total
Digital society skills				
Use of data and artificial intelligence	1		Not applicable	1
Digital inclusion				
Innovation in teaching and learning	1	1	1	3
Feedback and assessment			1	1
<b>Total</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>5</b>

## 3.3. The voices of the researchers

This section presents the reflections of some of the researchers who participated in different editions of the Education Sector Fund on the significance of having a tool – more specifically the Education Sector Fund – that finances research, as well as the importance of researching issues related to technology and innovation in education. In general, they all agree on the significance of having a fund to support research that also strengthens the bridges of communication between the researchers themselves and policymakers in Uruguay.

It must also be noted that this fund promotes quantity and quality of research and helps consolidate national and international research networks and groups. This enhances Uruguay's ability to generate original and high-quality knowledge and puts the country on the world map.



**María Alejandra Balbi Broch**  
Scientific leader

Project “Design and assessment of the impact of a professional development programme in formative assessment (FA) for secondary education mathematics teachers”.  
FSED\_2\_2019\_1\_156641

“This Education Sector Fund challenge highlights the need not only to provide funding for research in education and its dissemination, an aspect that ANII has been promoting with greater emphasis, but also to create new opportunities for the findings to be effectively used by those responsible for implementing changes. We don’t advocate a one-way model in which research dictates practice; instead, we support an approach of reciprocal interaction where evidence emerges from practice and, in turn, practice is nourished by evidence.”





**Gabriela Varela Belloso**  
Scientific leader

Project "Innovations for the teaching and learning of Natural Sciences enabled by digital technologies".  
FSED\_2\_2020\_1\_163647

"The remote labs that have been designed promote equity because they provide access to equipment not available in public education from just anywhere in the country at any time, they reduce the costs of the commodities necessary for some experimental practices typical of techno-scientific education, and they encourage making the most of face-to-face classroom time. In addition, these devices allow experiments to be carried out with a large number of students simultaneously and, above all, they enhance the development of critical thinking and metacognition through a didactically designed experimental proposal. Sources of funding for the generation of knowledge and products with actual educational impact play a key role in the development of the country."



**Lionel Bossi Garavaglia**  
Scientific leader

Project "Youth, digital skills and content gaps in Latin America (*HabLatam*)".  
FSED\_2\_2018\_1\_150808

"Funding research is essential when it comes to addressing complex social challenges, generating knowledge that drives progress and the well-being of society, and designing effective solutions that will promote quality education. The findings of our project have crossed borders to be incorporated into the International Telecommunication Union's Child Online Protection Guidelines, providing policymakers with valuable guidance. This impact is an example of the significance of supporting rigorous research in strategic areas such as technology and educational innovation".



**Valeria Odetti**  
Scientific leader

Project "Institutional management of a blended curriculum. Case study in Uruguay's secondary education".  
FSED\_2\_2021\_1\_170300

"It's essential for us as scientists to have tools such as the Digital Education Sector Fund that will support our research work. We also believe that this has a twofold impact on the education community. One is that it allows us to know about and systematize the many valuable experiences occurring in educational institutions that do not always come to light. The other is that it offers educational policy a body of evidence that contributes to decision-making on the transformations that the world of education requires".



**Lucía Otero y Nicolás Veiga**  
Scientific leaders

Project "Deep learning of Exact Sciences through inclusive online digital challenges".  
FSED\_2\_2019\_1\_155436

"The funding of proposals concerning didactic research is clearly of the utmost importance, especially if they focus on optimizing the best classroom strategies that will have a direct impact on students' deep learning. It not only contributes to the consolidation of learning communities and teaching innovation ecosystems, but it also helps to develop assessment and monitoring instruments that are essential for the continuous improvement of processes. However, the impact of the activities undertaken as part of the project would be much greater if these kinds of experience had the necessary political and financial support to make them generalizable to all educational levels, and, in particular, in the context of the new competence-based national curricular framework".



**María Castello**  
Scientific leader

Project "Pilot project for a Living Sciences laboratory with "Do it Yourself" (DIY), "Do it with Others" (DIWO), and "Bring Your Own Device" [BYOD] technologies".  
FSED\_2\_2018\_1\_150716

"This project gave us a great opportunity to link up with international groups with experience in the development of low-cost technologies and manufacturing spaces, such as the MIT Little Devices Lab in Boston, and the SDG Solution Space in Geneva. There was a positive impact on the research group, which enriched both the theoretical and practical foundations of the technologies typical of a maker space. This also helped to integrate cutting-edge technologies such as microfluidics into teacher training. In short: participation in and the support given by the Education Sector Fund had a medium- and long-term impact which expanded and enhanced the qualifications of trainers."



**Fundación  
Ceibal**