Lines of Research of the Education Sector Fund, "Digital Inclusion: Education with New Horizons" Modality

This Fund is jointly coordinated by the *Agencia Nacional de Investigación e Innovación* (ANII or National Research and Innovation Agency), *Fundación Centro Ceibal para el Estudio de las Tecnologías Digitales en la Educación* (Ceibal Centre Foundation for the Study of Digital Technologies in Education [Research Centre - Ceibal Foundation]), and Canada's International Development Research Centre (IDRC). The following is a description of the five lines of research and priority topics. These lines seek to describe the research priorities to be included by the Fund "Digital Inclusion: Education with New Horizons."

First line of research:	Priority topics:
New Ways of Knowing, Learning, Teaching and Assessing	New pedagogies (deep learning[1]) and technologies
	Cognition and meta-cognition
	New curricular approaches
	Learning in multiple environments
	Formal, informal and non-formal learning
	Self-learning and personalization

Key Questions: Under what conditions and with what pedagogical strategies can technologies best help us learn to learn? What practices, instruments and devices make it possible to develop, assess and identify deep learning?

Description: The aim is to understand how ICTs can encourage cognition, and in what contexts they can improve the cognitive and emotional processes of children and adolescents. The aim is to analyze the extent to which learning in multiple contexts (formal, non-formal and informal) with the aid of technology can influence learning styles and processes. The deep learning approach seeks to rethink curricular and pedagogical strategies that recognize different ways of learning and share one´s learning.

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[1] The aim of "deep learning" is for students to acquire skills and abilities that will prepare them to be creative, be connected and solve problems collaboratively throughout their lives. That is to say, all-round human beings that will not only contribute to but also generate common good in an age based on creativity, knowledge and interdependence. The deep learning skills are: Global citizenship, Collaboration, Character (personal attributes), Communication, Creativity and imagination; Critical thinking and knowledge construction; Real world problem solving, and Use of ICTs for learning. *Source*: Fullan, Michael, and Maria Langworthy (2014). *A rich seam: How new pedagogies find deep learning.* Pearson. www.michaelfullan.ca/wp-content/uploads/2014/01/3897.Rich_Seam_web.pdf

Second line of research:	Priority topics:
Digital age educators	Early training and use of technology
	Innovation in teacher professionalization
	The teacher as a knowledge worker: motivation and recognition
	Teacher profiles in the XXI century
	New ways to boost performance

Key Questions: What are the main challenges in the teaching culture posed by the incorporation of technologies in the classroom? What strategies and incentives are critical to accelerate teacher development processes in relation to the pedagogical and knowledge changes facing today's society?

Description: Identifying and contextualizing frontier strategies for instilling a digital culture into teachers consistent with the pedagogical challenges of both deep learning and the incorporation of technology. Identifying different teacher profiles and knowing how to professionalize technology-mediated learning and how to disseminate these achievements at the society level. Identifying and systemizing practices that will allow teachers to develop by learning new ways to access, process, generate and share knowledge.
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Third line of research:	Priority topics:
Social uses of ICTs and digital culture	Knowledge use and generation practices
	Digital literacy, fluency and maturity
	Digital subject, citizenship and identity
	Social networks and communities
	Changes in school culture

Key Questions: What are the rights and responsibilities that should guide the responsible and strategic use of the internet? How do you promote a critical, active spirit in a context of new knowledge and skills such as digital citizenship, digital identity or information literacy? What are the most suitable strategies for the promotion of digital maturity?

Description: Investigating the uses that children and adolescents make of technology both inside and outside educational centres. Analyzing and monitoring the development of knowledge-building capacities with the aid of digital technology. Identifying critical aspects in order to develop knowledge and competencies related to skills such as information literacy, digital citizenship or computational thinking. Identifying strategies for the promotion of a critical and proactive spirit regarding the generation of knowledge and the management of a digital identity. Description of the evolution of the different gaps (degrees of access to knowledge and effective use, ownership, consumption and production thereof) by students and their families and closest social circles.

Fourth line of research:	Priority topics:
Extended achievements in learning	Performance
	Assessment of achievements in both formal and informal education
	Effects on school learning
	New rubrics, metrics and indicators

Key Questions: What transformations in knowledge, skills, talents and behaviours are identified through the use of technology? How do you articulate the monitoring and assessment of traditional knowledge with deep learning skills? How do you design more versatile assessment devices consistent with the learning encouraged by the use of technologies?

Description: Promoting, facilitating and conducting studies that will make it possible to assess the educational and social impacts of Plan Ceibal, with a focus on the 'knowledge gap.' Identifying, analyzing and systemizing adaptable and customizable instruments that will assess the development of knowledge and skills as well as deep, lifelong learning. Designing a baseline for recognizing achievements in learning (knowledge, skills, talents) encouraged through the formal and informal use of digital technologies. Including and longitudinally comparing indicators of learning achievement.

Fifth line of research:	Priority topics:
Resources and platforms	Production and ownership of educational resources
	Accessibility, usability and inclusion
	Mobile devices ('bring your own device', or BYOD for short)
	DIY technologies

Key Questions: How does the educational sector prepare itself for technological change and new innovation cycles? How do you develop an ecosystem of innovation and continuous monitoring that can adopt and tailor the new technologies to the learning needs of children and adolescents?

Description: Identifying and analyzing the global trends of technologies (software, hardware) applied to education. Analyzing ICT incorporation experiences both inside and outside the classroom. Analyzing the relationship between applications, contents and devices used by the students autonomously, with the aid of the teachers and collaboratively between peers. Monitoring the use, production and collective exchange of educational resources for the effective use of new pedagogical practices. Quality studies of user experience. Designing new educational tools in support of the teacher's work. The aim is for research in this field to become an input for technological monitoring, strategic planning, the

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identification of trends and   predictive modelling applied to the use
and evolution of demand in infrastructure and technology platforms.

Methodological approaches:

These lines of research lay particular stress on three priority methodological approaches:

- o **Learning analytics:** Using the production and integration of data to know the uses that students and teachers make of ICTs in order to incorporate them into the teaching and learning processes. The aim is to interpret a wide array of data produced and collected on students in order to guide their academic evolution, understand and/or predict future actions and identify problematic elements or challenges. This approach is designed to support new, more personalized teaching and learning ecosystems.

- o **Foresight:** Supporting and enriching teaching and learning processes through predictive modelling and other advanced analytical techniques. Identifying trends in educational innovation. Foresight is based on the definition of feasible scenarios. A scenario can be regarded as a representation of a future situation and the steps leading to it. In this context, the possible scenarios are usually developed on the basis of information from various experts in education, public policy or technological development and are obtained through opinion collection tools, panels, etc. This methodology ranges from the analysis of key variables and strategic actions to be taken into account to teaching and learning contexts supported by digital technologies.

- o **Benchmarking:** Compilation of experiences of using and adopting technologies in education to promote the systemization and comparison of practices at both the national and international level. This methodological approach is not restricted to cumulative prospect in terms of the number of cases or experiences to be studied, but it rather puts forward a proposal concerning the set of local/national contextual factors that enrich the comparative perspective. This approach seeks to apply the comparative method scientifically to gain new knowledge by analyzing the similarities and differences between different teaching and learning experiences with the aid of digital technologies.