Data literacy:

Exploratory study on the case of Ceibal Support Teachers

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Executive Summary

This study was undertaken in Uruguay[1] 10 years into the implementation of a digital inclusion policy aimed at all primary and lower secondary students in the country (students aged 6 to 14 years old). This programme is called Plan Ceibal[2], and the research focused on the perceptions and needs of Ceibal Support Teachers – who play a special part in the success of this programme in schools – in relation to the new literacies (more precisely data literacy) based on the use of different digital (particularly educational) platforms.

The objectives of this study were: a) to explore the Ceibal Support Teachers' levels of knowledge and kinds of use related to the production and use of information, b) to analyze use-associated assessments, difficulties and main needs, c) to come up with recommendations for educational institutions on ways of improving the experience of the teaching staff with digital educational platforms. The methodology of work involved a mixed design that included discussion groups and an online survey. Both strategies provided us with valuable inputs for an introduction to the topic for the case of the education community, and Ceibal Support Teachers in particular.

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1 Uruguay is located in the Southern Cone of Latin America. It's one of the smallest countries in terms of territory and it has a population of 3.3 million inhabitants. It stands out for its high level of Human Development, according to the Human Development Report (UNDP, 2015).
2 Plan Ceibal: an educational programme that has succeeded in assuring access to Information and Communication Technologies (ICTs) for the student and teacher populations of primary and lower secondary middle education in Uruguay. Access the site: www.ceibal.edu.uy

Presentation

The increasing use of devices in today's societies makes it necessary to develop skills to take ownership of digital content and resources. This new context has become a challenge and an opportunity for educational institutions in terms of integrating and promoting the notion of new literacies.

This study understands the concept of 'new digital literacies' as the knowledge and skills that help to develop new or alternative forms of expression, communication and social interaction for the development of strategies for finding, understanding, assessing and creating information in the context of the Internet (Frank et al, 2016; Qin and D 'Ignazio, 2010). As proposed by UNESCO Bangkok (2015), such skills must always be promoted with a critical, ethical and effective attitude which will enable the full participation of individuals in different personal, professional and social spheres. In order to research the topic in Uruguay's education community, Fundación Ceibal and Plan Ceibal joined forces to study the (Ceibal Support) teachers' perception of the use of information on educational and school management platforms[3].

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3 Uruguay is located in the Southern Cone of Latin America and is noted for being one of the smallest countries in the continent in terms of territory. It has a population of 3.3 million inhabitants and stands out for its high level of Human Development (UNDP, 2015).

The table below presents a description of each of the educational platforms.

	Objective	Responsible entity	Further information
PAM Adaptive Mathematics Platform	Offers activities and content in mathematics, enabling the teacher to monitor student evolution in real or deferred time.	Plan Ceibal	www.ceibal.edu.uy/pam
CREA Educational social network	Promotes collaborative work through the exchange of materials, tools and specific content among students, teachers and families.	Plan Ceibal	www.ceibal.edu.uy/crea
GURI Unified Management of Records and Information	Provides updated information on teachers, officials and students in the national education system.	CEIP-ANEP	www.ceip.edu.uy/ programas/guri
SEA Learning Assessment System	Online assessment tests for the development of standards on knowledge acquired at each level of primary education.	CEIP-ANEP	www.anep.edu.uy/sea

Table 1. Description of the educational platforms used by the Ceibal Plan

Methodology

The target population was the Ceibal Support Teachers, the educators responsible for promoting the use and ownership of Information and Communication Technologies (ICTs) in education. The Ceibal Support Teachers' work involves supporting classroom teachers in the integration of ICTs, promoting knowledge and resource ownership, projects and innovative programmes related to Plan Ceibal[4]. There were 26 discussion groups made up of 10 participants each, which involved the participation of 237 Ceibal Support Teachers from all over the country. 23 coordinators from the Educational Technology Centres (one for each departmental jurisdiction) also participated.

The methodological design involved a mixed strategy which included discussion groups and the implementation of an online survey, which was responded to by 54% of the teachers. Some of the main characteristics of the respondents are that 95% are women and 80% are 22-44 years old[5].

Both the discussion groups and the survey were based on two large dimensions of analysis:

• The Ceibal Support Teachers' knowledge and assessments of the production and use of (particularly educational) information based on the available platforms. This dimension explored the Ceibal Support Teachers' level of knowledge of the new literacies, the use they make of the available resources and platforms, as well as their assessment of and views on the subject.
• The Ceibal Support Teachers' needs in terms of educational platforms available (functionalities, resources, content), with the aim of identifying the main factors hindering ownership and the habit of producing and analyzing data.

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4 The figure of Ceibal Support Teacher arose at the inception of Plan Ceibal in 2007. According to CEIP data, there are 255 Ceibal Support Teachers - between 6 and 11 per departmental jurisdiction – as of February 2015. At: www.ceip.edu.uy/documentos/2015/dcte/cte-funciones-15.pdf
5 It must be pointed out that most of the teachers performing this role do so on a school shift and are classroom teachers on the other shift. As a result of this, many of their opinions and experiences reflect both roles.

The processing of the data was undertaken using the qualitative analysis program MAXQDA 12, which helped to identify the main dimensions, categories and relationships that served as input for the presentation of results. The following is the matrix of categories
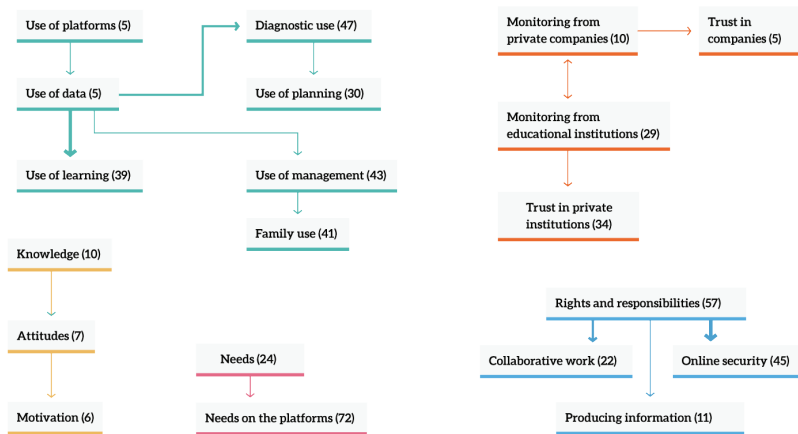

Figure 1. Matrix of categories

Main results

KNOWLEDGE AND OPINIONS

The Ceibal Support Teachers attach great importance to the production and use of useful information for educational improvement, as shown in graph 1. They also present high levels of trust and confidence as regards public institutions, especially educational institutions. These results are a contrast to their perceptions of private companies, particularly social networks, which are comparatively lower.
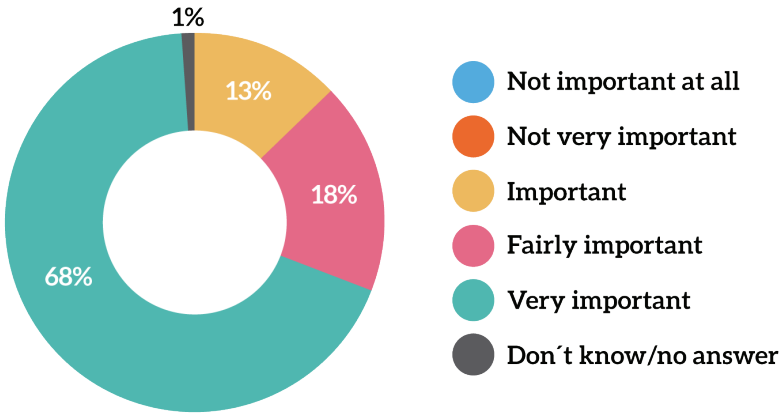
Graph 1. Importance attached to the production and use of data for educational improvement

As regards the use of the information available on the platforms, two kinds of use were identified:

Use related to the diagnosis of learning. The analysis of content shows that Ceibal Support Teachers are aware of platforms and make use of them on a regular basis. The teachers identify different strategies based on online work for the diagnosis of student performance. The ability to access relevant information on the students in real time is beneficial for the Ceibal Support Teachers as it allows them to monitor the students' work and share information about their self-perception. So online work facilitates the monitoring of work but, more importantly, it also helps to promote processes for customizing learning. In real time, the Ceibal Support Teachers can easily identify achievements or difficulties occurring during the learning process at the group and individual levels. These inputs

help to rethink lessons, depending on the content that needs to be dealt with more in depth.

Management-related use, associated with systematizing and updating the pupils' personal information on the GURI and CREA platforms. This brings several benefits that make it possible not only to systematize the information, but also monitor the students year after year (the accumulated information is received by the teacher they will have the following year and by the Secondary Education subsystem), and it facilitates interoperability of information between various institutions such as Primary Education authorities, Plan Ceibal, Banco de Previsión Social (Uruguay's Social Security Bank)[6], and the Sistema de Información Integrada del Área Social (SIIAS or Integrated Information System of the Social Area)[7].
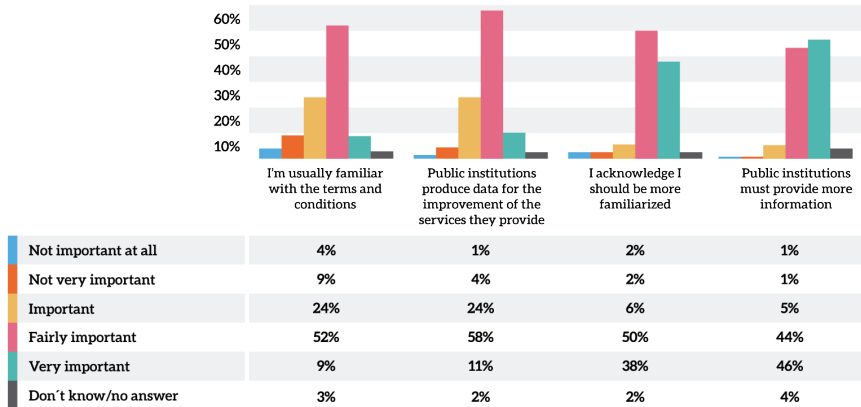
Finally, this kind of use offers benefits when it comes to working with families; The Ceibal Support Teachers welcome the access to useful information about the students' family context and the possibility of contact in a context where contact is rare.

NEEDS

In line with the dimensions on use, needs associated with diagnosis and management were identified. Regarding the former, the Ceibal Support Teachers' needs are related to the training of families, teachers and students in the responsible use of information. In particular, some needs have emerged related to online privacy and security issues. This is about promoting higher levels of reflection on the kind of data that must be uploaded to the platform, the stakeholders that should have access to them and how to safeguard this information in a secure manner. One can then observe the high levels of importance attached by Ceibal Support Teachers to the different statements about which they were asked as regards online security.
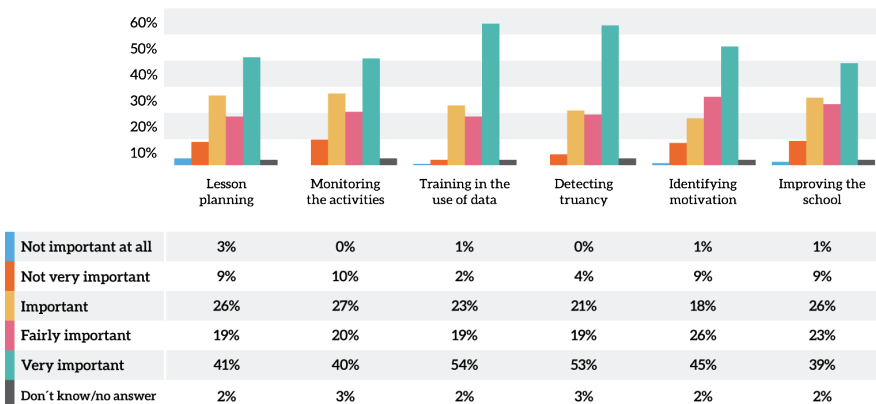
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6 The body responsible for the coordination and organization of the state's welfare and social security services.
7 The system that coordinates the exchange of information between different state agencies in order to systematize and link the data generated between them.

	I'm usually familiar with the terms and conditions	Public institutions produce data for the improvement of the services they provide	I acknowledge I should be more familiarized	Public institutions must provide more information
Not important at all	4%	1%	2%	1%
Not very important	9%	4%	2%	1%
Important	24%	24%	6%	5%
Fairly important	52%	58%	50%	44%
Very important	9%	11%	38%	46%
Don´t know/no answer	3%	2%	2%	4%

Graph 2. Level of agreement with the following statements

Regarding diagnosis-related needs, the Ceibal Support Teachers have identified all the activities as very necessary (see graph 3). The main activities include training in the use of data, as well as the possibility of developing new skills through the interpretation and better use of the inputs emerging from the platforms themselves (e.g. reports). Another significant detail is the use of information both in real time and offline for the detection of cases of truancy. For this kind of activity, the student's commitment and motivation regarding the different proposals are key factors, in addition to the feeling of belonging to the group.

	Lesson planning	Monitoring the activities	Training in the use of data	Detecting truancy	Identifying motivation	Improving the school
Not important at all	3%	0%	1%	0%	1%	1%
Not very important	9%	10%	2%	4%	9%	9%
Important	26%	27%	23%	21%	18%	26%
Fairly important	19%	20%	19%	19%	26%	23%
Very important	41%	40%	54%	53%	45%	39%
Don´t know/no answer	2%	3%	2%	3%	2%	2%

Graph 3. The need to produce and use data

Other training needs, in this case related to the improvement or development of resources on the platforms, can be summarized as follows:

- Content that can be more easily adapted by teachers, depending on the specific classroom needs.
- The possibility of PAM and CREA working adaptively for the preschool, first, second and third year levels.
- Higher levels of training in how to interpret reports or content provided by the platforms.
- The creation of a wiki- or forum-style space for exchange on the CREA platform.
- The creation of a content or rubric bank on CREA.
- Higher levels of training in the use of open educational resources.

Recommendations

The following are some recommendations to be taken into consideration by institutions and stakeholders in the education community to continue working on the improvement of educational practices for the promotion of new literacies:

1. **Expanding and enriching what is currently regarded as digital literacy**, in such a way that it is not restricted to just the development of competences and skills for the ownership of available digital content and resources, and so that dimensions such as participation in digital media, the critical use of information for decision making, an understanding of the responsibilities and practices involved in the safe use of information, data protection and privacy, among others, are reinforced.

2. **Continuing to develop and promote different spaces for training in the education community**, especially in terms of how to use the information to improve student management and monitoring. These spaces have to involve different modalities (formal, informal, virtual, face-to-face, individual and collective).

3. **Ensuring that training spaces are not limited to simply being sensitive to the challenges posed by the use of technology**, but that they also promote the proactive use of the new opportunities and resources offered by the digital spaces (for example, communities of practice, production, use and recommendation of educational resources, etc.). The suggestions also include providing higher levels of training in open educational resources, improving spaces for collaborative work and greater needs for content customization.

4. **Taking the necessary action to involve different stakeholders from the education community in this dialogue**. This includes principals, inspectors, parents, communities close to the school context, and so on.

5. **Establishing spaces for regular dialogue at the level of educational centres** in which information about this topic can be disseminated, queries answered, recommendations offered, talks given, and so on. These spaces for dialogue do not necessarily have to involve technology experts but people (educators and learners) who use technology on a regular basis and are interested in promoting a critical and reflective use of digital devices. This can go

hand in hand with the provision of new spaces and digital channels for horizontal dialogue (between peers) which will encourage open debate on these issues.

6. **Informing the education community of communication and information channels** and identifying specialized people and institutions that can provide information if there are questions or incidents, or if more guidance is necessary.

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