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TEACHER PERCEPTIONS OF THE TIME FACTOR IN ONE LAPTOP PER CHILD

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Teacher perceptions of the time factor in One Laptop per Child

ABSTRACT:

In this paper we analyze teacher perceptions of the time factor in One Laptop per Child. In the first part of this paper we present the state of the art of the incorporation of ICT in schools of Spain following the One Laptop Per Child program (the State plan known as Escuela 2.0).

Secondly, we present the qualitative methodology that we use for the study. We will obtain the data by analyzing the questionnaire, with open questions, from teachers

participating in the project in Catalonia, in TICSE¹ 2.0 framework.

Finally, we present the results and the teachers' conclusions about the time factor in the implementation of these programs. In general, the perception that teachers have about using technology is that it requires a lot of time. In their opinion, they need too much time to learn to use ICT and technical aspects of them mean wasted time.

KEYWORDS:

ICT, Formal learning, One Laptop Per Child, Teacher perception, Time management.

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1. <http://www.ite.educacion.es/es/inicio/noticias-de-interes/745-ique-opina-el-profesorado-sobre-el-programa-escuela-20>



INTRODUCTION TO MODELS 1:1

Over the last 30 years many countries have designed plans that promote ICT in teaching and learning processes (Alonso *et al.*, 2010). The aim of these projects is for schools to prepare their students for a new kind of society which involves not only knowing and using ICT already present in their homes, but also using them as learning tools (Adell & Castañeda, 2012).

If we focus on the last five years, many of these educational plans are based on the One Laptop per Child project, which was presented by Nicholas Negroponte at the Davos World Forum (2005).

All these projects are focused on developing low-cost laptops and making them available to every school-age child on the premise that this technological equipment helps students to develop competently within the Digital Society they are living in (Alonso, Area, Guitert & Romeu, 2012).

This way, we can see how the 1:1 model has become a trend in many countries in very different geopolitical spaces, as we find excellent experiments in Europe (such as “Iniciativa Magalhaes” in Portugal), Asia (India and South Korea) and America (both North and Latin America). As well as developing remarkable plans including the “Conectar Igualdad” project (Argentina) or “Una Laptop por Niño” (Peru), Latin America has the first country to achieve full technological equipment: Uruguay, where every pupil in the country, and their teachers, have laptops, thanks to the so-called CEIBAL Plan² (acronym meaning Basic Computer Education Connectivity for Online Learning) that began in 2006. Despite the considerable investments devoted to providing

2. <http://www.ceibal.org.uy>

each student with his/her own laptop, has not yet been possible to assess the impacts of such initiatives, draw conclusions and evaluate their cost-effectiveness (Alonso, Rivera & Guitert, 2013). This may be due to a variety of factors, such as short implementation deadlines, lack of clear goals or commitment to studying the impact and a lack of measurement tools. Along these lines, it should be noted that the reasons for investing in computer programs for pupils can be classified into three main categories (Severin & Capota, 2011):

- From an economic perspective, it is considered that technology plays an important role both in the production process and the results these processes offer.
- From a social perspective, we know these programs can help to reduce digital and social gaps. They also provide access to digital tools and to Internet to families and communities that would not otherwise be possible.
- From an educational perspective, these devices have the potential to provide new educational practices which by nature are student-centred and constructivist. They may also support the skills and abilities required in the 21st century.

Although, at first, the research on classrooms equipped with one computer per student was considered poor, the volume of documentation began to increase at the beginning of the 21st century. By 2006 Penuel had already identified 46 published studies focusing on this type of environment (Valiente, 2011). Among these studies, we could highlight the so-called “implementation studies” (Rockman, 2003; Russell, Bebell & Higgins, 2004). These are focused on describing the various initiatives studied, providing a comprehensive picture

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of how the program was designed. Taking these lines into account, the feeling is that more research is needed to reach a deeper understanding of educational practices that occur in these environments (Bebell, 2005).

We can see how the different countries in which the use of one computer per student environments have been implemented, share the following common objectives (Valiente, 2011):

- To provide students with the ICT skills and competences necessary to function as a citizen in the knowledge economy.
- Reduce the digital gap between individuals and social groups and generalize their access to ICT so that they are available not only at school but also at home.
- Improve the quality of teaching making it strongly student-orientated in order to improve academic achievement and reduce the gap between formal (school) and informal learning.

Some of the positives and negatives aspects of 1:1 models featured in recent research in different geographical areas are (Martínez & Suñe, 2011):

1:1 MODELS IN SPAIN: ESCUELA 2.0

In Spain, the Ministry of Education designed the program called Escuela 2.0 for innovation and modernization in education systems. It began during 2009 and was contextualized in the so-called Plan-E. The goal of this program was to reactivate the country's economy, and one of its pillars was the fact of using a laptop per student while improving the traditional classrooms with interactive boards and Internet connection. Besides its technical aspects, the program (which was based on an investment of 200 million Euros, financed by the central government and the autonomous communities) stressed the training of teachers and ICT coordinators. This training was not only based on the use of tools, but also focused on working on the methodological aspects of the introduction of digital resources in teaching and learning processes. Specifically, the program's lines of action were:

- Digital classrooms. Providing students and schools with ICT resources; laptops for students and teachers as well as effective,

Figure 1. Some of the positive and negative aspects of 1:1 models (Martinez & Suñe, 2011).

| POSITIVE ASPECTS |
|--|
| Teachers have perceived an increase in students' motivation. |
| The Digital Competence level of the students has been improved, along with their skills in terms of information. |
| The students have gained autonomy. |
| They have developed the corresponding listening and speaking skills typical of virtual environments. |
| NEGATIVE ASPECTS |
| The high financial cost of implementing this type of model. |
| Connectivity problems; sometimes the schools' bandwidth is not enough to perform the required tasks. |
| The shortage of supply of quality digital educational materials. |



standardized digital resources in the classroom.

- Ensuring Internet connectivity and interconnectivity within the classroom for all equipment. Internet availability access in the students' homes at particular times.
- Promoting teacher training in the technological, methodological and social aspects of the integration of these resources into daily teaching practice.
- Generating and providing access to digital educational materials tailored to the curricula for teachers and students, as well as their families.
- Involving students and families in the acquisition, custody and use of these resources.

At the first phase, Escuela 2.0 was aimed to include the fifth and sixth years of primary education. However, there was a specific case, similar to that of Catalonia, where the program was initiated at different levels: as there was already a plan to implement ICT in primary education in Catalan schools, in this territory the initial stage of this program was implemented in the early years of secondary education.

Most of the regions of Spain, as well as the autonomous cities of Ceuta and Melilla, joined the government proposal to participate in the Escuela 2.0 Program. Only Madrid and Valencia did not join the initiative in order to move forward with ICT plans they had already designed. The program was renamed, with a variety of titles in on different regions: Eskola 2.0 in the Basque Country, Clic-Escuela 2.0 in the Canary Islands, Abalar in Galicia, Escuela TIC 2.0 in Andalusia and EduCAT in Catalonia.

In its first two years of implementation, the approximate figures were:

- 30,000 classrooms 2.0 implemented.
- 650,000 students in the third cycle of primary education and the first cycle of Secondary Education had of a laptop.
- 160,000 teachers participated in ICT training activities.
- The production and use of digital educational content, designed both by teachers and by publishers, increased significantly³.

At a press conference in April 2012, the Secretary of State for Education, Training and Universities, Ministry of Education, Culture and Sport announced that budget cuts related to the educational system included the cancellation of the Escuela 2.0 Program. It was also explained that it would be replaced by another achieving a saving of 60% compared to the previous year's Escuela 2.0⁴.

THE TICSE 2.0 PROJECT: THE POLICIES OF ONE COMPUTER PER CHILD IN SPAIN

The TICSE 2.0 project is the Spanish acronym for "Las políticas de 'un ordenador por niño' en España"; the policies of "one computer per child" in Spain. *Visions and practices of teachers in Escuela 2.0*. A comparative analysis between regions (EDU210-17037) is an approved project forming part of the 2010 National R + D round of the Ministry of Science and Innovation of the Spanish Government. It lasts 3 years and it is coordinated by the University of La Laguna, with Manuel Area as main researcher. More than 50 researchers are involved in this proposal, located at different universities (Laguna, Autónoma de Barcelona, Autónoma de Madrid, Barcelona, Cádiz, Coimbra, Complutense de Madrid, Extremadura, Oberta de Catalunya, Oviedo, País Vasco, Salamanca, Sevilla and Valencia).

3. <http://www.ite.educacion.es/es/congresos/iii-congreso-escuela-20>.

4. <http://ordenadoresenlaula.blogspot.com.es/2012/04/escuela-20-y-el-final-de-la-politica.html>.

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The objectives of this project are:

1. To identify the opinions, expectations and ratings of primary and secondary education teachers participating in Escuela 2.0, as well as the use of ICT in their teaching in Spain.
2. To explore what types of teaching practices or learning activities are organized in the classroom context by using these technological resources and analysing their impact on the teaching and learning methodology, as well as the way they integrate and coexist with traditional materials, especially textbooks.
3. To write a comparative analysis of these phenomena among some Autonomous Communities currently participating in the Escuela 2.0 Program (Andalusia, Asturias, Catalonia, Canary Islands, Extremadura, and the Basque Country) and others not participating in it (Madrid, Valencia).
4. To create a website with an Observatory for policies called *one computer per child* intended for the mass provision of ICT in the school systems of countries in the Latin American community. It is dedicated political administrators and Spanish and Portuguese researchers and teachers.

The research is divided into different phases:

- **Phase one** (2010/2011 academic year).
The aim of this first phase was to identify opinions and needs of teachers in Escuela 2.0. To collect data, we used an online questionnaire consisting of open and closed questions. The data collected in this survey are shown in a provisional report called: *What do teachers think about the 2.0 school program? An analysis by regions*⁵. In cooperation with the education authorities,

the survey was e-mailed to the different schools that participated at Escuela2.0.

- **Phase two** (course 2011/2012). The intention of this second phase was to carry out 8/10 case studies by autonomous community, with the aim of exploring the teaching practice developed in the classroom context.

Below is an analysis of the 661 responses made by teachers in Catalonia in the phase one (survey), in relation to their perception of the time factor.

VIEWS AND PRACTICES OF TEACHERS IN CATALONIA CONSIDERING ESCUELA 2.0

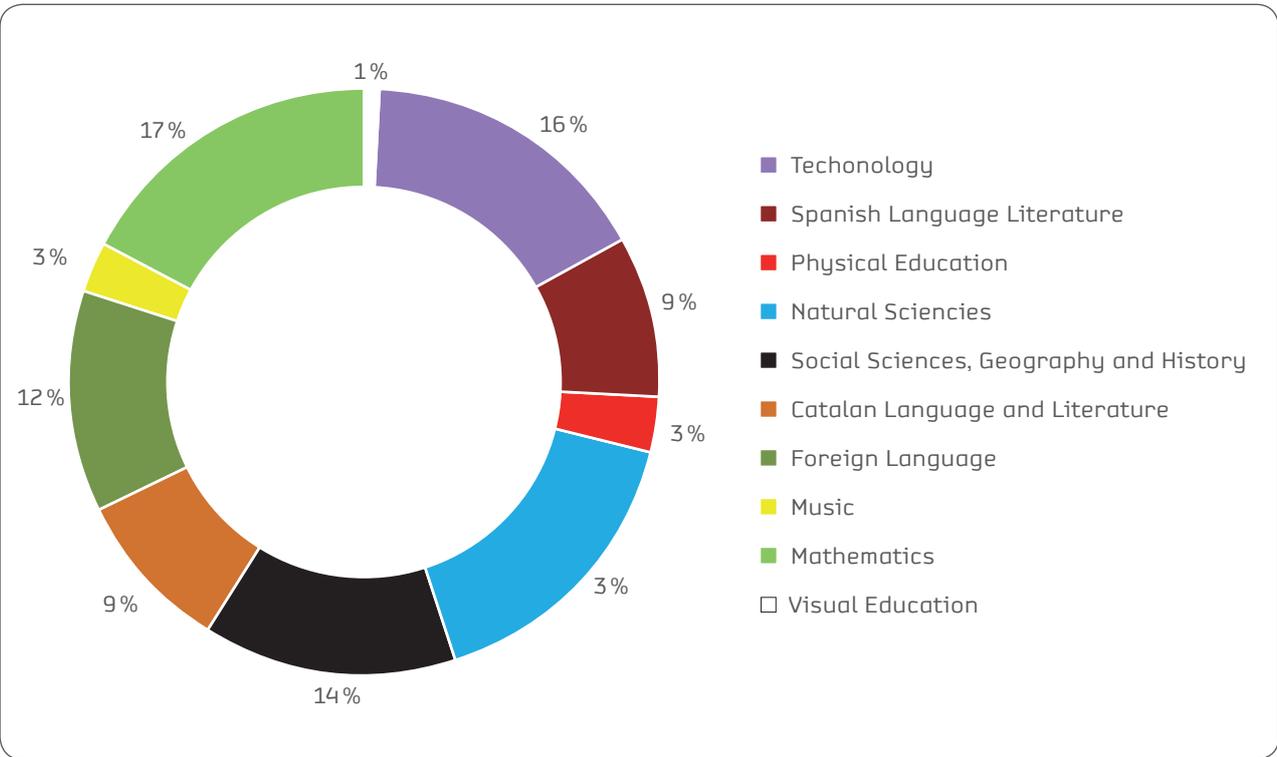
When analysing the profile of teachers who responded to the survey, it can be seen that they are mainly women (59% of cases), aged between 35 and 55 years old (76% of responses) and with more than ten years of experience in the classroom (77% of responses). These are secondary school teachers (96% of the cases) who work in a school where the laptops belong to the students (81% of responses) and are members of the Department of Mathematics, Technology and Natural Sciences (50% of cases, a high proportion considering that the questionnaire mentioned ten different educational areas).

Regarding the type of actions that are performed with ICT in the teachers' classrooms, the following are identified:

1. BY STUDENTS:

- Creating papers with a text editor (82% of responses).

5. http://ntic.educacion.es/w3/3congresoe20/Informe_Escuela20-Prof2011.pdf.



- Searching for information on the Internet (76% of responses).
- Doing online activities or exercises (74% of responses).
- Creating multimedia presentations or small videos (43% of responses).
- Exposing papers supported by the PDI or the projector (47% of responses).
- Publishing online papers in blogs, wikis, webs...(38% of responses)

2. BY THE TEACHERS:

- Explaining lessons or issues using the IWB or projector (73% of responses).
- Evaluating pupils (54% of responses).
- Contacting pupils or their families (54% of responses).
- Creating and/or using Webquest and other online resources to promote collaborative work among students (27% of responses).
- Participating in online projects collaborating with other schools (10% of responses).

TEACHERS' OPINION CONCERNING THE TIME FACTOR

Analysing the closed-ended questionnaire it can be perceived that 20% of teachers believe ICT is a distraction and waste of time and 80% of the teachers oppose this statement. It is also worth mentioning that 50% of the people involved claim that one of the effects of ICT in education is the necessary reorganization of time and space.

In order to answer the question of how teachers from Catalonia appreciate the time factor in 1x1 environments, we focus on analyzing the open questions from the questionnaire TICSE Project.

Regarding the role of the ICT coordinators or heads of technology in the classroom, the questionnaire indicates that they are highly appreciated by the teachers because they are always available to help their colleagues and

willing to work extra hours: *He does hundreds of jobs and he doesn't have time for everything. He should have more time for his work.*

Lack of time is also shown when discussing training. In this sense, although teachers expressed willingness to participate in practical courses, lack of time prevents them from going further. They also ask for more time to implement what they learn.

When analyzing the responses about the most valued aspects of EduCAT program, we can see that only two of the 379 contributions received refer to the time factor, noting that the implementation of the 1:1 model has brought an improvement in learning time management as well as in the field of lesson design.

By contrast, among the 416 responses related to negative aspects of the project, there were approximately 60 direct references to the time factor:

- Firstly, we find a series of contributions referring to teachers' conceptions of time-wasting in different situations:
 - The slowness of internet connections, which also disrupts the classroom: *When the network doesn't work you must have a plan B and, sometimes, even a plan C.*
 - Too much time invested in accessing digital content.
 - Time spent switching on devices: *In the end, classes last just 30 minutes. Lots of time is wasted switching every computer on.*
 - Technical problems.
 - Keeping the computers in a cart makes the distribution and start-up processes very slow. *Our experience shows that this process takes almost 20 minutes. If we multiply this time over the weeks, we find that many hours have been lost.*
- Secondly, a sector of teachers considered that students immersed in the program often waste time playing or chatting: *All the time*

you need to be making sure they are not connecting to Facebook instead of doing class work.

- Thirdly, the lack of time for basic tasks, such as training or creating materials, is seen as negative by teachers. It is considered that if teachers had time, they could create much higher quality resources than those currently on the market:
 - I invite the person responsible to give teachers the opportunity to invest more time from their schedule in creating materials. At the same time, a financial or time reduction reward is also suggested for teachers who have already created materials. If this is not done, in five years the materials will remain as bad as they are today.*
 - Using applications is easy to learn but creating activities is more difficult and involves an amount of time that the teachers do not have.*
 - There is a lack of adequate teaching materials as well as the time to create them.*
 - Creating activities and maximizing those that we already have involves many hours that teachers do not have available.*
 - There is a lack of quality materials useful for working with students. This means teachers have to invest a huge number of hours in preparing resources.*
 - The most negative aspect of the project is the lack of time for teachers to work to form and create new materials.*
- Finally, it is considered that the number of hours available to technical or ICT coordinators to fulfil their tasks is nowhere near enough: *It is recognized that there is a lack of hours available for ICT coordination and for computers maintenance personnel.*

IN CONCLUSION

From an analysis of the responses, it is clear that, to a large extent, the teachers participating in the survey believe that, as



indicated by Cuban, Kirkpatrick and Peck (2001), the time factor has a great influence on technology integration in the classroom. Firstly, the lack of time is seen by teachers as a limitation when training themselves or creating materials to use in their classrooms. Secondly, teachers feel that, in many cases they need to spend too much time in the classroom fixing technical aspects of ICT, especially when equipment does not work as expected.

Concerning the use of ICT in the classroom, we can see how different types complement one another (Simon, 2007): Transmitting Technologies (traditional static teacher and student roles are maintained, ICT are used as a support tool in lectures); Interactive Technologies (students conduct individual tasks with computers); and Collaborative Technologies (resource-oriented collaborative knowledge construction).

Although we are aware of the limitations of relying on data exclusively based on a survey,

we can see how the results are comparable with those extracted by other research. For example, these ideas are consistent with results of Pelgrum (2001), who conducted a study in which management teams from 24 different countries identified the main obstacles perceived by teachers when implementing ICT in their programming. Among the ten most frequent problems shown by the research, two are directly related to the time factor: the fourth is scheduling computer time and the seventh is insufficient teacher time.

In this sense it can be concluded that, although teachers are aware that ICT have a number of features that open up new educational possibilities and that are likely to produce improvement that would be very difficult to achieve their absence (Coll, Onrubia & Mauri, 2008), their implementation involves a necessary temporary sacrifice in terms of preparing learning and materials.

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