Reviews of Educational Policy regarding one laptop per child: *Escuela 2.0* program in Castilla-La Mancha, Spain.

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Abstract

The present study assesses the attitudes and practices of teachers in relation to the national program Escuela 2.0 in Spain, implemented in 2009. The study analyzes attitudes and needs of 424 teachers and it assesses teaching practices developed with Information and Communication Technologies (ICT). Data is analyzed through mixed methods with various instruments using descriptive analysis, factor analysis and a detailed analysis regarding teaching practice from 21 cases. In conclusion, one third of teachers properly integrate Educational Technology into practice. Moreover 62% of teachers support the applied one laptop per child policy and have positive feedback in this regard, however two thirds of the teachers in the sample integrate technology with isolated activities, adapting persisting traditional pedagogical models. There are deficiencies concerning school performance, group work, problem solving and communication in learning activities. Therefore, students need educational guidance for the appropriate use of ICT in the learning process.

Keywords

Active Learning, Digital Competence, Educational Technology, Information and Communication Technologies, Interactive Whiteboard, Politics of Education.

I. Introduction

The national program *Escuela 2.0* in Spain was implemented in September 2009 with the aim to provide accessible equipment and digital content from all schools to integrate ICT into school life, enhance material resources and teacher training. The program provides an interactive whiteboard per classroom, wireless Internet connection and a laptop to each student in all 5th and 6th grade classrooms in primary education. There is some similarity to the *Social Renewal Operative Programme* in Hungary and the *G@TIH Project* in Turkey, which aims to develop a technological infrastructure in schools to enable the successful integration of ICT in education.

Currently in 2013, the Escuela 2.0 program has resource problems due to the economic situation in the Spanish context, so the public policy of a computer per student in classroom is undermined in Spain. The decision to decrease the resources in this policy declines or hinders ICT use in classrooms leading to greater difficulties to exploit the advantages of the Educational Technology.

The regional administration in Castilla-La Mancha does not have a priority to provide computers as they feel schools have enough and they are not being utilized properly. The priority for the regional administration arises from the European Council: Improving educational levels, in particular with the aim of reducing the dropout rate to less than 10 percent. In the case of Spain, the estimated dropout rate is 15 percent.

As for the immediate future in Castilla-La Mancha (Spain), there is an initiative called: *Extended School Plan: Digital Backpack* (Official Journal of Castilla-La Mancha, DOCM, 2013) that is aimed at pushing forward the process of teaching and learning in the digital mode, by replacing textbooks on paper with digital educational resources. Moreover, on July 14, 2013, the Counselor of Education, Culture and Sports in Castilla-La Mancha, has announced that during the next academic year 2013/2014 "digital backpack will be a reality in 44 schools in Castilla-La Mancha"[1]. This project consolidates after the success of the results of the pilot study which analyzed the possibilities of digital content in various schools during the year 2012.

After describing the current context of the integration policies of Educational Technology in primary education, it is necessary for more research in the Spanish context to analyze the situation of the use of technology in educational settings. This research aims to analyze the use of technology in classrooms and teachers' perspective regarding the implementation of the *Escuela 2.0* program, therefore this work brings rigorous scientific evidence to the educational field.

II. Theoretical Framework

Several studies cite arguments for integrating technologies into educational contexts (NCCA, 2004), arguing several advantages regarding inclusion in education. These advantages are linked to student motivation and development of Digital Competence. The benefits relate to the unproven potential benefits of ICT for teaching and learning, including gains in students' achievement and motivation. The second argument acknowledges the pervasiveness of technologies which leads to the subsequent need to acquire Digital Competence to be functional in our knowledge society (Eshet-Alkalai Y, 2004).

In the Spanish context, educational policies in recent years have tried to promote the integration of technology into the classroom through a series of plans, such as the *Internet in the classroom* (Segura et al. 2007) and *Plan Avanza* (MEC, 2007), which highlight results that indicate a favorable trend in the integration of educational technology in the classroom. Notably *eEurope* and *eLearning*

[1] http://www.castillalamancha.es/actualidad/notasdeprensa/mar%C3%ADn-%E2%80%9Cla-mochila-digital-ser%C3%A1-una-realidad-en-44-centros-de-la-regi%C3%B3n-el-pr%C3%B3ximo-curso-escolar%E2%80%9D

programs show positive feedback regarding the importance of resources in order to work with technology in classroom (European Commission, 2006).

The *Escuela 2.0* program provided, among other initiatives, a number of material resources, providing laptops and interactive whiteboards. In this sense, it opens a lot of possibilities to teachers and it delegitimizes those arguments excusing the lack of material resources when trying to apply the technologies into educational practice. (*Author* and Jimenez 2011, 2).

Constant changes and evolution of society regarding the use of technology are promoting the undeniable fact that it is important to use ICT with consistency and focused into an effective practice. However, we must consider that resources available in the classroom is a necessary but non-sufficient condition; an active and dynamic methodological approach must be implemented to leverage all the advantages offered by technology (Marchesi and Martin 2003; Balanskat et al. 2006; Condie and Munro 2007). Material resources in schools do not automatically bring a change in traditional education making it essential to change pedagogical and methodological approaches (Marchesi & Martin 2003; Balanskat et al. 2006; Condie and Munro 2007). The importance of teaching methods is essential. *With a constructivist teaching method, ICT facilitates a process of discovery learning* (Area, 2007, 46).

a. Digital Literacy and Digital Competence

Key competences for lifelong learning report (Education council, 2006) defines the core competencies in the European context and it delimits the term: digital competence. Moreover, the Royal Decree 1513/2006 (BOE, 2006) defines digital competence as the ability to search, obtain, process and communicate information, and to transform it into knowledge. It incorporates different skills ranging from information access to media transmission, including the use of information technology and communication as essential for learning and communicating.

Decrees regulating school curriculum define digital competence as the treatment of information and digital technology, it is an updated concept of digital literacy adapted to new digital times (Area 2008, 11). Digital literacy involves a mastery of software and hardware that enable skills related to critical analysis and selection for processing information into knowledge (Bawden 2002; Gutiérrez 2003; Snyder 2004).

> Digital Competence is the set of knowledge, skills, attitudes (thus including abilities, strategies, values and awareness) that are required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socialising, consuming, and empowerment (Ferrari 2012, 43).

Figure 1: Components of Digital Competence. (Ferrari, 2012, 43)

Media and Information Literacy (MIL) Curriculum for Teachers (UNESCO, 2011) is a review of the main aspects of curriculum design and the skills required for educators. The evidence of the skills of young people and use of technologies is reflected in numerous studies (Livingstone and Bober 2004; Lenhart et al. 2005; Kennedy et al. 2006; Oliver and Goerke 2007). *Education itself must fundamentally change to accommodate the skills and interests of these digital natives* (Bennett et al. 2008, 775).

b. One Laptop per Student Policies and Technology Integration

The aim of these initiatives is to provide laptops and Internet access for students to use at home and at school. These initiatives are expanding rapidly in countries around the world with the purpose of improving the quality of education and to compensate for inequalities. The model of one computer per child is a growing trend of technology in education, along with the growing use of online assessments (Greaves and Hayes 2008).

Several studies highlight the positive impact of technological immersion of 1:1 model in schools (Silvernail and Gritter 2007; Maninger and Holden 2009; Bebell and Kay 2010). The educational support and teacher training in classrooms enable the development of knowledge construction and innovative teaching practices which facilitate the development of learning processes (Penuel 2006; Greaves and Hayes 2008; Holcomb 2009). Despite the numerous advantages regarding One Laptop per Child (OLPC) application programs (Shapley et al. 2009), it is worth noting that some schools have canceled their 1:1 program for various reasons (Hu 2007).

OLPC program was driven by the Massachusetts Institute of Technology. OLPC is a relatively new project announced by Nicholas Negroponte with the idea of a low-cost laptop for use by children. Nugroho and Lonsdale (2010) reviewed the literature to identify and assess existing approaches and the impact of OLPC programs worldwide. OLPC policy initiative was carried out successfully in several countries like Haiti, Paraguay, Brazil and Uruguay. The countries of Latin America and the Caribbean have become more enthusiastic adopters of the OLPC initiative. These models try to compensate the digital divide in these contexts, trying to promote equal opportunities in access to knowledge.

In Latin America, Spain and Portugal there were several programs:

- *Barefoot Foundation* in Colombia
- *Um Computador por Aluno* in Brazil
- *Telmex* Education and Digital Culture program and Carlos Slim Foundation in Mexico
- *Zamora Terán Foundation* in Nicaragua
- *Escuela 2.0* program in Spain
- *Una Computadora por Niño* in Paraguay
- *Una Laptop por Niño* in Peru
- *Magalhaes* program in Portugal
- *Ceibal Plan* in Uruguay

Ceibal Plan in Uruguay was the only country in the world where every child in the school system had access to a computer. These programs tried to transform educational practice, implementing resources and boosting teacher training in order to enhance digital competence.

OLPC model has been evaluated by several authors (Penuel 2006; Bebell and Kay 2010), and results indicate that these models involve changes in the teaching-learning process, changes in classroom organization and the way in which students learn and interact. They also highlight development of research skills and engagement by students

Moreover in equipped schools with one computer per student, teachers tend to change their mindset or vision of teaching to a more constructivist perspective based on students' activity. In this sense, students develop a higher level of thinking due to relevant and more complex learning activities. They also found an increase in communication and interactions between students (Shapley et al. 2009).

III. Methodology

This study is part of a larger research project called *The Politics of a Computer per Child in Spain. Teacher Visions and practices in Escuela 2.0 Program. A Comparative Analysis between regions*[2]. It is funded by the National R + D + i of the Ministry of Innovation and Science (EDU-17037).

The research aims to collect basic data on the "visions" that have the teachers involved in the *Escuela 2.0* program in Castilla-La Mancha. The study aims to investigate the views and demands of teachers about the importance of the *Escuela 2.0* Program. It also analyzes the future prospects of the teaching material in a school paper of the century, developed teaching practices with ICT in the classroom, the attitudes of teachers and their training needs.

Through a quasi-experimental approach, we propose a study with 3 dimensions (see Table 1), which seeks to respond to the research objectives. 21 cases are analyzed in depth using various instruments; moreover, a quantitative analysis is carried out using collected data from the sample of 424 teachers gathered in the autonomous community of Castilla-La Mancha (Spain) through descriptive analysis and factor analysis.

In short, data are collected from various instruments that provide quantitative and qualitative information. Triangulation can ensure that there is sufficient evidence to uphold the validity and minimize error variance (Goetz & LeCompte, 1988). There is a data triangulation and methodological triangulation (Cohen, Marion & Morrison, 2000) by the use of quantitative data from the questionnaire and qualitative inputs from observation sessions, interviews and researcher's journal. In conclusions section we get similar results from the different applied instruments. This fact improves research validity from this aforementioned strategy.

[2] http://www.ite.educacion.es/es/inicio/noticias-de-interes/745-ique-opina-el-profesorado-sobre-el-programa-escuela-20

DIMENSION	INDICATORS	INSTRUMENTS
DIDACTIC USE OF ICT AND ORGANIZATION	*Contents using Technologies*	Questionnaire Classroom observation Journal of the researcher Interviews with teachers
	Planning teaching with ICT activities	
	Teaching Model	
	Options to group and organize students	
	Interactions between teachers and students	
	ICT distribution in school	
	Communicative possibilities	
STUDENTS' SKILLS AND LEARNING PROCESS	*Students' motivation and attitudes*	
	Environment and learning experiences	
	Development of digital competence	
	Opinions of students	
	Activities developed with ICT	
PROFESSIONAL DIMENSION AND ATTITUDES	*New challenges and difficulties*	
	Pedagogical innovations with ICT	
	Training requested by teachers	
	Expectations about Escuela 2.0 program	
	Opinions of teachers	

Table 1: Dimensions, indicators and instruments

a. Participants

The population of the research is constituted by 5th and 6th grade teachers in public primary education participating in the *Escuela 2.0* Program (years 2010-11 and 2011-12) in Castilla-La Mancha, Spain. The sample consists of 424 teachers working in 5th and 6th grade in Castilla-La Mancha of which 57.3% are women and 42.7% are men. This sample includes teachers of all ages (see Figure 2).

Around 30,000 are all the primary school teachers working in Castilla-La Mancha region (Spain), which is the population in the present study. From a confidence level of 95%, and from the aforementioned population, the sample must be over 380 teachers. Response distribution is 50% and error rate is 5%. Therefore, the sample is representative we work with 424 primary school teachers, over 380 which is the minimum recommended from these data.

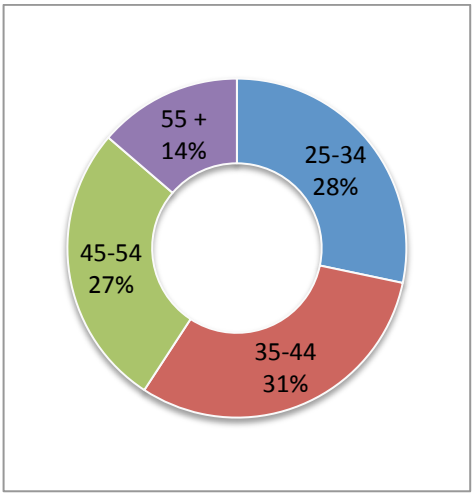
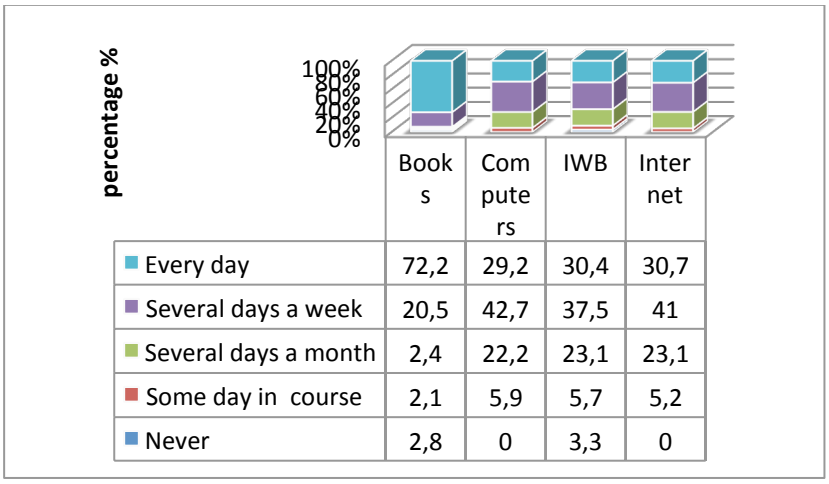


Figure 2: Teachers' age

Most teachers (71.9%) make use of textbooks. As for the frequency of use of the resources related to technology, about 30% of teachers use computers and interactive whiteboards every day. About 40% of teachers use these ICT resources several days a week and close to 20% use computers and interactive whiteboard several days a month (see Figure 3).



	Books	Computers	IWB	Internet
Every day	72,2	29,2	30,4	30,7
Several days a week	20,5	42,7	37,5	41
Several days a month	2,4	22,2	23,1	23,1
Some day in course	2,1	5,9	5,7	5,2
Never	2,8	0	3,3	0

Figure 3: Use of material resources. IWB= Interactive Whiteboard

b. Instruments

Data collection was performed using a survey method. A questionnaire was designed and distributed with closed questions. The instrument or questionnaire consists of 40 items distributed across three dimensions (see Tables 2, 3 and 4). The questionnaire was distributed through the Internet, with an on-line form accessed via password through a given server located in the Institute of Educational Technology (ITE, Spain). The dissemination of the questionnaire was done through collaboration with Training centers in Spain, the Educational Administration in Castilla-La Mancha (Spain) and visiting the school of the sample directly.

The questionnaire was created specifically for this study by the research team with the intention to explore and identify the opinions and demands of teachers in 5th and 6th grade of Spanish primary education.

Regarding the case studies, qualitative techniques are employed in data collection, such as classroom observations (3 visits per case), individual interviews with each teachers and an observer diary in which researchers collected continuously and systematically information, incidents, events or processes during the visits. All these instruments analyze in detail the practice of 21 teachers from the study sample. The report of each case is organized according to the mentioned dimensions (Table 1) and there is an inter-case analysis elaboration.

All these instruments were essential to obtain data in all cases, descriptive analysis and factor analysis. Qualitative validity of content provided by expert judges provides a value of Aiken V (V = S / [n (c-1)]) greater than 0.8 in all items. Construct validity was examined by exploratory factor analysis, using the criterion of extraction of eigenvalues > 1, and the method of varimax rotation. Moreover, an obtained value (over 8) of Cronbach reliability in all dimensions is acceptable (Hair, Anderson, Tatham, & Black, 1998). All instruments (questionnaire, interviews and observation diary) were designed and validated by the main research team from all regions in Spain:

> Las Politicas de un "Ordenador Por Niño" En España. Visiones y prácticas del profesorado ante el Programa Escuela 2.0. Un análisis comparado entre Comunidades Autonomas. Entidad/Empresa financiadora: Ministerio De Ciencia E Innovacion. Importe: 78.650 euros. Duración: desde 01/01/2011 hasta 31/12/2013)

IV. Data analysis

a. Descriptive Analysis

Data provided by 424 subjects in the sample is analyzed in the 3 dimensions. Cronbach's alpha reliability is 0.831 in dimension 1, 0.885 in dimension 2 and 0.854 in dimension 3.

With respect to educational and organizational dimension (Dimension 1), results show that 89% of teachers believe that digital materials should be visible, open and free on the Internet and 77.6% of teachers believe that public administration should create and publish more on-line materials and web sites as they are useful resources to find materials. Teachers stress the importance of digital materials by 67.6%, while 48.1% consider that publishers should remain the creators of didactic materials. Only 27.1% of the sample believed that teachers should always use Web 2.0 in classroom (items 1.4, 1.5, 1.6, 1.7 & 1.8).

About 62% of subjects believe that the *Escuela 2.0* program has improved the quantity and quality of ICT available at schools, although they highlight that paper textbooks will still be needed (items 1.3 & 1.9)

1.- Didactic use of ICT and organization	%				
	1	2	3	4	5
1.1.-Each students works individually with a computer	3.1	9	**30.9**	**46.9**	**10.1**
1.2.-The students are organized into small groups, working independently with ICT	**6.8**	**25.5**	**45.5**	21.5	0.7
1.3.- Despite the fact there are many ICT resources, paper textbooks will still be needed	4.7	12	**21.5**	**22.6**	**39.2**
1.4.- Public administration should create and publish more on-line teaching materials	3.8	3.1	**15.6**	**18.9**	**58.7**
1.5.- Publishers will remain the main creators of online materials	7.1	12.5	**32.3**	**23.3**	**24.8**
1.6.- *Agrega, Educared* and *Aulablog* websites are very useful resources	2.1	5	**25.2**	**25.9**	**41.7**
1.7.- Digital teaching materials on Internet should be visible , open and free	2.4	1.4	**6.4**	**9.4**	**80.4**
1.8.-Teachers should always use Web 2.0 (blogs, wikis, social networks, Youtube,...) in classroom work	**14.9**	**18.4**	**39.6**	15.1	12
1.9.- *Escuela 2.0* program has improved the quantity and quality of ICT in your school	3.3	8.7	**25.9**	**33**	**29**
1.10.- This program has improved online communication between teachers in your school	14.4	19.1	**28.3**	**23.6**	**14.6**
1.11.- Escuela 2.0 has increased contact and communication with other schools via the Internet	**23.6**	**29**	**29**	12.7	5.7
1.12.- This program has facilitated communication between teachers and educational administration	12.7	21.5	**30.9**	21.7	13.2
1.13.- Escuela 2.0 has increased communication between teachers and families	**32.5**	**29.5**	**25.2**	9	3.8
/ / 1 = Strongly Disagree / / 2 = Disagree / / 3 = Neutral / / 4 = Agree / / 5 = Strongly Agree / /					

Table 2: Dimension 1. Didactic use of ICT and organization

57% of teachers emphasize that each student works individually with one computer and only 22.2% believe that students are organized into small groups working independently with ICT (items 1.1 & 1.2)

Regarding communication (items 1.10, 1.11, 1.12 & 1.13), about 35% of teachers believe that communication on-line between teachers has improved and a similar percentage of teachers believe that communication between teachers and educational administration has enhanced. Only about 15% of teachers believe communication with other schools via the Internet and communication between teachers and families has improved, therefore benefits regarding communication have relatively low percentages.

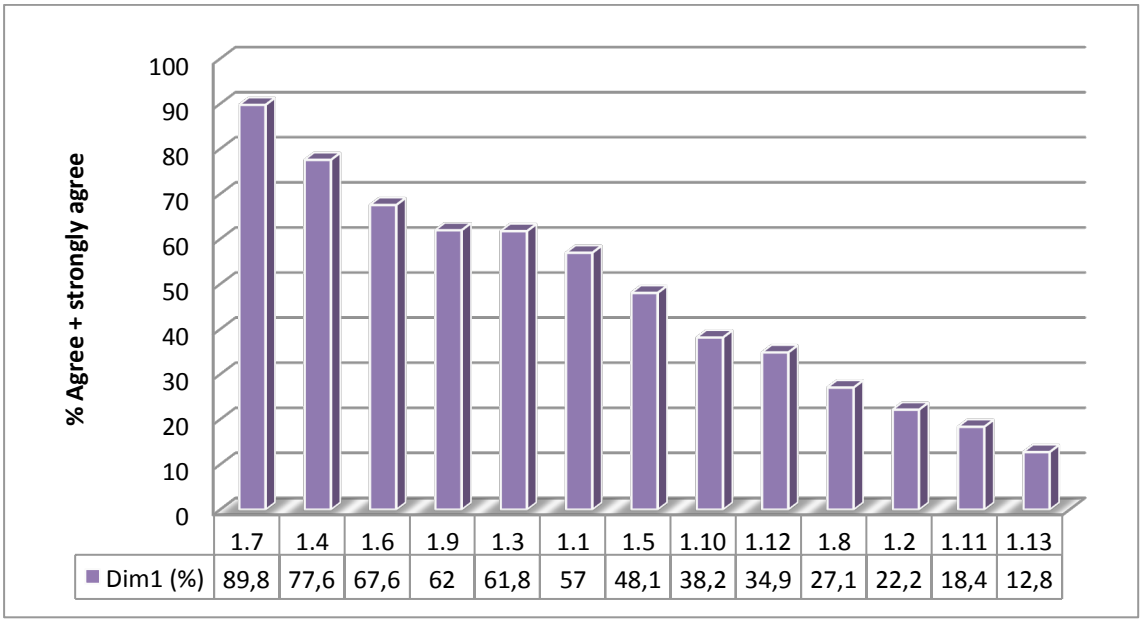


Figure 4: Dimension 1. Didactic use of ICT and organization

Regarding students' skills and learning dimension (dimension 2), almost 70% of teachers agree that students use digital technologies for leisure, play and to have fun. With similar percentages, students use ICT to communicate with friends, they know how to use ICT technically and they are able to search and locate information on the Internet (items 2.1, 2.2, 2.4 & 2.5) but only 52.4% believe that students know how to seek information from various sources and resources (item 2.13).

About 60% of teachers believe that students are more motivated and involved in class work, developing digital competence and information management (items 2.9 & 2.11). Moreover, 43.2% of teachers believe that students are able to work with multimedia and audiovisual products (item 2.8).

2.-Students' skills and learning process	**%**				
	1	**2**	**3**	**4**	**5**
2.1.- Students use digital technologies for leisure, play and fun	1.9	5.7	**20.3**	**35.4**	**36.8**
2.2.- Students use ICT to communicate with friends	5.0	7.1	**13.2**	**37.7**	**37**
2.3.- Students use digital technologies to study and do their homework.	7.5	20.5	**42.5**	25.5	4
2.4.- They know how to manage ICT technically	0.9	3.5	**20**	**42.7**	**32.8**
2.5.- They are able to search and locate information on the Internet	0.9	5.7	**25.7**	**41**	**26.7**
2.6.-Students know how to use ICT for problem solving and decision-making	**9**	**24.8**	**45.5**	17	3.8

2.7. - They know how to work collaboratively in communication environments (blogs, wikis, social networks).	**18.2**	**26.9**	**32.3**	18.4	4.2
2.8.- They are able to make multimedia and audiovisual products	26.4	25.9	**30**	30	13.2
2.9.- Students are more motivated and involved in class work	4.2	9.2	**25**	**42.7**	**18.9**
2.10.- They have improved their performance	**13.4**	**23.6**	**42.2**	17.9	2.8
2.11.- They have developed digital competence and information management	2.4	9	**28.5**	**43.9**	**16.3**
2.12.- Students work better together and collaboratively	9.7	23.1	**38.7**	23.1	5.4
2.13.- They know how to seek information from various sources and resources	2.6	11.1	**34**	**37.3**	**15.1**
2.14.- They improve their expression and communication	**22.6**	**29**	**38.7**	8	1.7
2.15.- Students have acquired knowledge in the subject	6.6	18.6	**46.5**	24.1	4.2
2.16.- They can express themselves through different languages (textual, iconic, visual ...)	8	26.4	**42**	20.5	3.1
/ / 1 = Strongly Disagree / / 2 = Disagree / / 3 = Neutral / / 4 = Agree / / 5 = Strongly Agree / /					

Table 3: Dimension 2. Students' skills and learning process

Approximately 30% of the subjects emphasized that students use digital technologies to do homework, work more collaboratively and gain better knowledge of the subject (items 2.3, 2.12 & 2.15).

Only about 20% of teachers believe (items 6, 7, 10 & 16) that students have improved their performance, they know how to use ICT to solve problems, make decisions, work collaboratively in communication environments and express themselves through different languages (textual, iconic, visual ...). Only 9.7% of the sample say that students know and have improved how to express themselves and communicate (item 2.14).

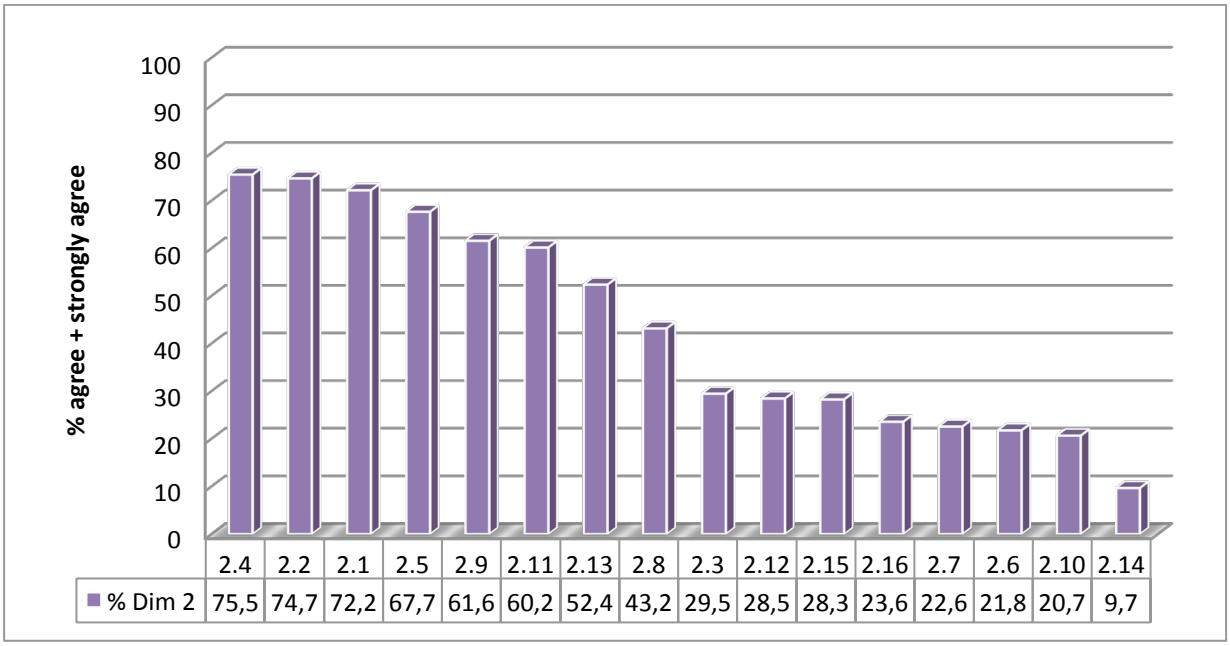


Figure 5: Dimension 2. Students' skills and learning process

Regarding the professional dimension and attitudes (Dimension 3), about 60% of teachers say that there are needs regarding investment policy in classrooms and provision of computers in the classroom to modernize education (3.5 & 3.9).

44% of teachers believe they have proper training to use ICT in teaching practice and the information disseminated related to the *Escuela 2.0* program is adequate (items 3.1 & 3.8).

About 35% of subjects were satisfied with the training courses, with the distribution of digital learning materials and they believe that the current ICT education policy is successful (Items 3.3, 3.4, 3.7, 3.10 & 3.11).

Only 21.5% believed that the policy of giving each student a computer should extend to all courses and stages of the school system (item 3.6) and only 14.8% of teachers believe that their peers at schools are trained properly to develop the *Escuela 2.0* program (item 3.2).

3.- Professional dimension and attitudes	**%**				
	1	**2**	**3**	**4**	**5**
3.1.- I believe that I have the proper training to use ICT in my teaching practice	8.3	14.4	**33.5**	**30.9**	**13**
3.2.- I think my colleagues in my school are trained to teach in the *Escuela 2.0* program	**14.9**	**33.3**	**37**	12	2.8
3.3.- The Administration is offering adequate training for teachers participating in the *Escuela 2.0* program	**14.9**	**29.7**	**28.3**	21.5	5.7
3.4.- I am satisfied concerning the ICT training courses I have attended in *Escuela 2.0* implementation	12.7	19.6	**29.7**	23.8	14.2
3.5.- I consider that there are needs with regard to investment policy in classrooms to modernize education	6.1	8.7	**24.5**	**23.8**	**36.8**
3.6.- Policy of giving a computer to every student should be extended to all courses in the school system	**34.4**	**19.1**	**25**	11.6	9.9
3.7.- I think the current ICT educational policy that is being developed in my Autonomous Region is successful	16.7	22.2	**27.8**	17.2	16
3.8.- Information disseminated among teachers about the *Escuela 2.0* program is adequate	4.7	8.5	**42.5**	**40.6**	**3.8**
3.9.- The provision of computers and other technological resources in classrooms is appropriate	3.1	8.3	**27.4**	**49.5**	**11.8**
3.10.- Teacher training is well developed	5.9	9.4	**51.7**	**29.5**	**3.5**
3.11.- Creation and distribution of digital materials or digital content on the Internet is suitable	2.8	14.2	**48.3**	**31.6**	**3.1**
/ / 1 = Strongly Disagree / / 2 = Disagree / / 3 = Neutral / / 4 = Agree / / 5 = Strongly Agree / /					

Table 4: Dimension 3. Professional dimension and attitudes

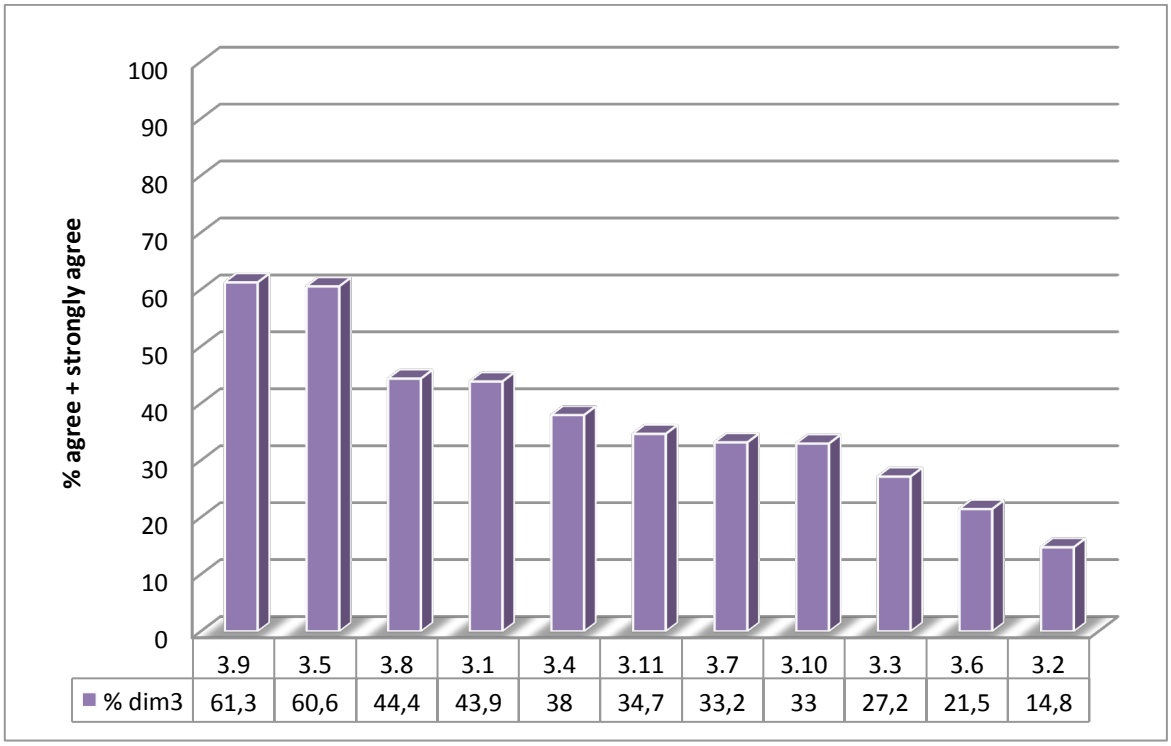


Figure 6: Dimension 3. Professional dimension and attitudes

b. Factor Analysis

An exploratory factor analysis was conducted on the three studied dimensions. For the first dimension, a factorial analysis is feasible according to the Kaiser-Meyer-Olkin (0.773) test and Bartlett's sphericity test (0.00). The extraction method is principal component analysis and the rotation method is Varimax with Kaiser (see Table 5). In dimension 1, the three extracted factors explain 48.986% of the total variance.

	Component		
	1	2	3
1.1.-Each students works individually with a computer			.724
1.2.-The students are organized into small groups, working independently with ICT			.754
1.3.- Despite the fact that there are many ICT resources, paper textbooks will still be needed	-.325	.394	
1.4.- Public administration should create and publish more on-line teaching materials		.765	
1.5.- Publishers will remain the main creators of online materials		.413	-.334

1.6.- *Agrega, Educared* and *Aulablog* websites are very useful resources		.633	
1.7.- Digital teaching materials on Internet should be visible, open and free		.774	
1.8.-Teachers should always use Web 2.0 (blogs, wikis, social networks, Youtube,...) in classroom work	.384		.372
1.9.- *Escuela 2.0* program has improved the quantity and quality of ICT in your school	.610		
1.10.- This program has improved online communication between teachers in your school	.783		
1.11.- Escuela 2.0 has increased contact and communication with other schools via the Internet	.764		
1.12.- This program has facilitated communication between teachers and educational administration	.768		
1.13.- Escuela 2.0 has increased communication between teachers and families	.632		

Table 5: Dimension 1: Rotated component matrix. Extraction Method: Principal Component Analysis. Varimax with Kaiser

The nominated factors in the first dimension include the following:

1. Resources and communication
2. Instructional materials on-line
3. Grouping of students

Exploratory factor analysis in dimension 2 is verified by the analysis of the Kaiser-Meyer-Olkin (0.896) test and Bartlett's sphericity test (0.00). The extraction method is principal component analysis and rotation method is Varimax with Kaiser (see Table 6). In dimension 2, three extracted factors explain 59.364% of the total variance.

	Component		
	1	2	3
2.1.- Students use digital technologies for leisure, play and fun		.754	.477
2.2.- Students use ICT to communicate with friends		.732	.424
2.3. - Students use digital technologies to study and do their homework.	.610		
2.4.- They know how to manage ICT technically	.530		
2.5.- They are able to search and locate information on the Internet	.621		-.432
2.6.-Students know how to use ICT for problem solving and decision-making	.708		
2.7. - They know how to work collaboratively in communication	.496		

environments (blogs, wikis, and social networks).			
2.8.- They are able to make multimedia and audiovisual products	.534		
2.9.- Students are more motivated and involved in class work	.667		
2.10.- They have improved their performance	.733		
2.11.- They have developed digital competence and information management	.730		
2.12.- Students work better together and collaboratively	.742		
2.13.- They know how to seek information from various sources and resources	.730		
2.14.- They improve their expression and communication	.677		
2.15.- Students have acquired knowledge in the subject	.712		
2.16.- They can express themselves through different languages (textual, iconic and visual)	.691		

Table 6: Dimension 2: Rotated component matrix. Extraction Method: Principal Component Analysis. Varimax with Kaiser

The nominated factors in the second dimension include the following:

1. Use of ICT for learning
2. Use of technology for fun
3. Use of technology to communicate

Exploratory factor analysis in the third dimension is verified by the analysis of Kaiser-Meyer-Olkin (0.869) and Bartlett's sphericity test (0.00). The extraction method is principal component analysis and rotation method is Varimax with Kaiser (see Table 7). In dimension 3, three extracted factors explain 65.022% of the total variance.

	Component		
	1	2	3
3.1.- I believe that I have the proper training to use ICT in my teaching practice			.766
3.2.- I think my colleagues in my school are trained to teach in the *Escuela 2.0* program			.772
3.3.- The Administration is offering adequate training for teachers participating in the *Escuela 2.0* program	.588		.578
3.4.- I am satisfied concerning the ICT training courses I have attended in *Escuela 2.0* implementation	.580		.545
3.5.- I consider that there are needs with regard to investment policy in		.79	

classrooms to modernize education		5	
3.6.- Policy of giving a computer to every student should be extended to all courses in the school system		.806	
3.7.- I think the current ICT educational policy that is being developed in my Autonomous Region is successful	.470	.717	
3.8.- Information disseminated among teachers about the *Escuela 2.0* program is adequate	.702		
3.9.- The provision of computers and other technological resources in classrooms is appropriate	.619	.404	
3.10.- Teacher training is well developed	.745		
3.11.- Creation and distribution of digital materials or digital content on the Internet is suitable	.695		

Table 7: Dimension 3: Rotated component matrix. Extraction Method: Principal Component Analysis. Varimax with Kaiser

The nominated factors in the third dimension include the following:

1. Resources and training
2. 1 laptop per child policy
3. Teacher Training

c. Analysis of cases

The practice of 21 teachers from the study sample is analyzed in detail. They are primary school teachers in Castilla-La Mancha from four provinces (Albacete, Ciudad Real, Cuenca and Toledo) who voluntarily participated in the research in 2012-13. Information is collected through structured interviews and observations from classroom practice (3 sessions per case). The report of each case is organized along the dimensions of the study (see Table 1). Inter-case analysis is made building a matrix where relevant dimensions intersect with each case with the following elements analyzed:

- Teaching model
- ICT Activities
- Teachers' opinions
- Students' opinions
- Explanatory factors
- Innovation and Transfer

Regarding dimension 1, there are details concerning the teaching model, innovation, transfer and explanatory factors of the case. The teaching model applied in 21 cases is quite different if we compare with other cases. First, we note that there are about one third of cases applying a traditional teaching model, with an integration of very basic technologies despite the efforts and good intentions of teachers. In these cases, teachers simply apply technologies as a complement of textbooks, without active methodological approaches and using transmission and exhibition of information combining multimedia elements. Moreover, about half of the sample provides evidence of truly dynamic and innovative practices with active methodological approaches using ICT that provide competencies and autonomy of students. Particularly, 6 cases highlight a practice linked to collaborative learning.

In dimension 2, which is related to students' skills and learning process, students keep a very positive attitudes regarding the use of ICT in the teaching-learning process and they are highly motivated towards learning to use technology resources in their daily tasks.

Figure 7: Case 4.14CUTRI. Blogging. "C.R.A Los girasoles".
http://losgirasolesenhonrubia.blogspot.com/

In 6 cases, there is good management and autonomy of students in the use of collaborative technology resources in classroom. Students use technology for entertaining, leisure resort, for searching information, to work on school tasks and to contact with their peers. With regard to autonomy in ICT use, there are clear differences from case to case; while approximately one third of students demonstrate autonomy and effectiveness when they use various technological tools (blogs, wikis, webquest ...), in other cases, there is a lack of autonomy that requires a lot of support from teachers.

Regarding the third dimension that analyses professional dimension and attitudes, vision of teachers, in 21 cases analyzed, the majority maintains two positions which are related to their professional beliefs which usually become an obstacle to ICT integration across the curriculum. The first position (cases 1, 2, 6, 7, 8, 10, 11, 14, 15, 17, 19, 20, 21) fosters a practice with adapted technologies and applications without in-depth analysis. Thereby, practice is reduced to instrumental knowledge and technical skills. From the perspective of the mentioned second position (cases 3, 4, 5, 9, 12, 13, 16, 18), there are educational actions performed consciously and clearly professional that provide real integration of ICT into the curriculum. These teachers are the protagonists regarding methodological integration, pedagogical design and implementation processes of change in curriculum integration using ICT.

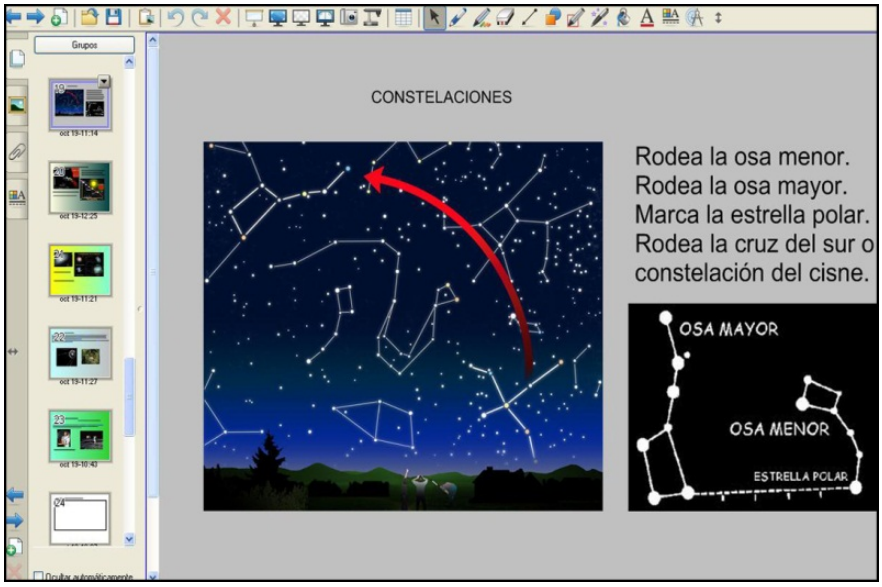


Figure 8: Case 303ABVICT. Interactive Whiteboard unit.

V. Discussion and conclusion

This study collected data concerning opinions and demands of teachers about the importance of the *Escuela 2.0* program, analyzing developed teaching practices with ICT in classroom and training needs. Ultimately, values and opinions of teachers regarding the implementation of 1:1 computer policy in Spain are analyzed. From the data collected with different instruments, there are several insights:

- It is noteworthy that 62% of teachers considered that the *Escuela 2.0* program has improved the quantity and quality of ICT in their schools (item 1.3) and a similar proportion believe that there are needs related to a policy of investment and provision of computers in the classroom (3.5 & 3.9). Moreover, very few teachers (21.5%) consider that the policy of giving each student a computer should extend to all courses and stages of the school system (item 3.6).

- A third of the teachers in the sample used daily technology (Figure 3) and applied ICT with an active methodological approach linked to effective integration in the classroom (4.3). The remaining teachers applied their practice with technologies linked to the rigidity of traditional methodological schemes.

- Teachers felt mostly (89%) that digital materials are important, they should be free and they should be supported by the educational administration; however only 27.1% considered that the use of Web 2.0 is important (items 1.4, 1.5, 1.6, 1.7 & 1.8). The textbook as material has great presence in the classroom (figure 3, item 1.9, Section 4.3).

- Improving online communication program Web 2.0 was supported by close to 35%, so that in this sense they should be improved (items 1.10, 1.11, 1.12 & 1.13).

- Around 70% of teachers think that students use digital technologies for entertainment and to communicate with their friends, students are able to seek information and they know how to technically handle the different ICT. About 60% of teachers believe that students are motivated by technologies and they develop their digital competence (items 2.1, 2.2, 2.4, 2.5, 2.9 & 2.11).

- Only 30% of teachers think that students work more collaboratively and they acquire knowledge of the subject. Only about 20% of teachers emphasize that students improve their performance in school, use ICT to solve problems, to make decisions, to communicate or to work in groups (items 1.2, 2.3, 2.6, 2.7, 2.10, 2.12, 2.15 & 2.16).

- Percentages close to 35% of the sample were satisfied with teacher training and believe that the current ICT education policy is successful (Items 3.3, 3.4, 3.7, 3.10 & 3.11).

Therefore, one third of teachers make appropriate and active integration of ICT in the classroom, and two thirds of the subjects of the sample considered that the implementation of the *Escuela 2.0* program, which represents 1:1 computer policy in school, is positive due to possibilities of ICT integration in Education (Marchesi and Martin 2003; Balanskat et al. 2006). Students keep positive attitudes regarding the use of ICT in the teaching-learning process and they are highly motivated towards learning to use technology. Although there is an agreement that we have to take into account that levels of success vary across initiatives based on the method and model of implementation (Holcomb, 2009).

The research study detailed in this article provides understanding of how 1:1 computer policy is implemented. There is some evidence that providing students with more ubiquitous access to resources, computers and teaching practices gives them more practice in using technology. Some researches even showed positive results regarding other factors, i.e. writing skills (Gulek & Demirtas, 2005). What is less clear from these several studies is potential from one-to-one initiatives to improve student achievement in core subjects (Holcom 2009; Bebell and Kay 2010). Moreover, some other researches note disappointing results in relationship to One Laptop per Child's techno centric approach (Warschauer, Cotten, Ames, 2011)

Moreover, students' purposes when using technology are related to entertainment and information seeking. There are similarities with Holcomb (2009) insights, who note that implementations across the country (USA) have been successful in not only increasing student engagement and motivation but also in improving student achievement measures. However, students show deficiencies in improving their performance in school, group work, problem solving and better communication. Moreover, in spite of the fact that the digital natives (Prensky 2001) condition of the students is driven by motivation, fun and playful search for information, students need educational guidance for the appropriate use of educational technology in learning processes due to the mentioned shortcomings.

The overall view is that a third of the teachers apply technology perfectly in education, bringing their importance of Web 2.0, so it is required to encourage these practices and enabling policies and initiatives that improve this data. Moreover 62% of teachers support 1:1 computer policy applied in Spain and they have positive feedback regarding the application of Educational Technology, however there is a considerable number of teachers (two thirds of the sample) that do not apply technologies in the classroom or they integrate them as isolated activities centered in pedagogical models that put into practice a passive role of the student and traditional approaches. In this sense, we agree with Kanaya, Light and Culp (2005), who found that when teachers perceive professional development activities to be aligned with the content schools expect them to teach and perceive the workshop to be relevant and useful to their teaching, they are more likely to integrate technology into their teaching.

Due to the numerous advantages highlighted by recent research about applied 1:1 policy models (Silvernail and Gritter, 2007; Holcom 2009; Maninger and Holden 2009; Shapley et al. 2009; Bebell and Kay 2010), a dynamic educational policy should be driven, a policy which encourages the use of technologies aimed at the development of digital competence.

This study reflects the voice, opinions and perspectives of teachers, who should be listened to attentively by leaders and managers of educational administration. Teachers know the daily life in classrooms, and as reflected in this research, we have excellent professionals who can integrate and apply educational technology in their daily practice. Other teachers hold positive attitudes towards ICT application, however there are difficulties in integrating technologies in the classrooms; these teachers need help, guidance and training. It is possible that despite their positive attitudes and intentions, teachers do not feel listened to by the respective administrations regarding their demands, requirements or needs.

Eventually, this research notes that one third of teachers are currently integrating ICT with Escuela 2.0 program resources, applying proper teaching methods. Moreover, there are teachers with positive attitudes towards ICT, who do not apply technology in classroom. Educational policy actions should try to provide effective resources, training and guidance to these teachers with positive opinions towards educational technology and provide information related to ICT benefits detailed and proved in many researches, for teachers that still hold negative attitudes towards Educational Technology.

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