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# **Ict in the Education of the Balkan Countries**

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## ICT IN TEACHERS' IN-SERVICE TRAINING PROGRAMS: A COMPARATIVE RESEARCH IN GREECE AND SERBIA

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### In-service training of teachers in Greece and Serbia

Taking into account the rapid socio-economic and technological changes of the new era, educational systems try to equip in-service teachers with knowledge and skills, in order to cope with the new demands of the modern school (Mavrogiorgos, 2005). On the other hand, teachers themselves have adopted a new attitude for managing their education and training: they tend to face it on a life-long basis in order to set new challenges and career goals, upgrade their knowledge and skills and acquire new competencies, since they believe that training during their career leads to their personal and professional development (Fullan & Hargreaves, 1992; Kedraka, 2008). The importance of teachers' knowledge of Information and Communication Technology (ICT) is recognized not only as useful, but as necessary for the teachers nowadays and it refers to some defined skills that teachers ought to attain: using and managing of basic computer applications, the Internet, software for presentations and publications, multimedia, being able to use educational software in class and generally, in the key educational domains (Arsovic, 2007).

**In Greece** there is a very long tradition in providing in-service training for teachers –especially those of elementary schools. Today in-service training is offered to elementary school teachers in schools for teachers called *Didaskaleia*, that function under the Pedagogical Departments of the Greek Universities in 7 cities. Teachers enter *Didaskaleia* after exams and if they succeed, they have the privilege of a two years sabbatical, so they are not interrupted by their school obligations during this long but also demanding training. For teachers of secondary education there are several public institutions that offer different training programs in many areas like: Environmental Education, Didactics, Class Management, Career Guidance etc and the last two decades, under EU funds a lot of projects run, offering all kinds of topics to the teachers willing to follow them (Zogopoulos, 2010). **In Serbia**<sup>1</sup> in-service training of teachers is an obligation, according to the law. Namely, the teachers are obliged to collect 100 hours of in- service education during a five years' period. This in- service education is organized in the form of two days seminars, during weekends, covering a great number of topics, like: Teachers' Professional Development, Teaching Methodology, Identification and Improvement of Particular Skills in Teaching Young Children, Innovations on Teachers' Professional Profile, Promotion of Teachers' Competencies for Choice and Evaluation of Textbooks, Leadership in Education, Communication Skills, Conflict Resolution and Class Management. Among these, there are more than 30 in- service programmes offered for the development of ICT skills, for example: Attaining Elementary Knowledge of Informatics and Preparing Teacher for Using a Computer, Classroom Teaching and On- Line Teaching- the Mixed Model, Multimedia Aspects of Teaching and Learning, Creating a Multi- Media Class, Teacher and Computer, etc. (Institute for Promotion of Education and Training, 2009).

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<sup>1</sup> Serbia's contribution to this paper is a part of the project «Education for knowledge-based society» No. 149001 (2006-2010), financially supported by the Ministry for Science of the Republic of Serbia

## **The use of ICT by teachers in Greece and Serbia**

In **Greece** a project, funded by EU run from 2002 to 2008 under the Ministry of Education, with the name “Information Society,, and (almost) all teachers of primary and secondary education were trained in order to be able to use ICT, even at a basic level. At the same time, the rapid intrusion of ICT in many aspects of life (eg banking, shopping, leisure etc) took place and obliged them to improve their ICT skills in order to cope with the demands of everyday life. As a result it is estimated that most of the Greek teachers are able to use a Personal Computer (PC) at a basic level (eg writing a text, getting information through the Internet, communicating with e-mails, etc). E-learning is included in many training programs for teachers and it becomes more and more popular because it permits them to study from home (Papavasileiou, 2007). On the contrary, ICT in **Serbia** is more widely used by pupils than by their teachers, while formal education is still realized through face-to-face communication. The findings of a relevant research point out that most of the teachers in Serbia can not use or integrate ICT in their every day teaching practice, although the majority of schools do own computers (Arsovic, 2007). It would be interesting to see if the situation has changed in the last two years in Serbia.

### ***Teachers as adult learners***

According to Andragogy Theory of Knowles (1980, 1998), like all adult learners, teachers’ learning is based in some assumptions: They have to know the exact reason to learn something· during the educational process they carry their background and experiences· they want to acquire knowledge relative to their work and/or life conditions they face·. Their learning orientations focus on specific needs and targets and not on general academic knowledge· the most important motives of learning are internal (need for job satisfaction, self-esteem etc). At the same time they face some difficulties in learning through ICT: The use of ICT is leading them to situations of stress and fear for the PC, especially to those who are not familiar with and to women more often. They tend to adopt a negative attitude for using ICT in job, because they fear that the PC will bring changes they cannot follow and thus, roles and hierarchy will change and they will not be able to profit. Not all of them own a PC, therefore there is not a chance for everyday practice. They have difficulty on terminology due to their poor level of using the English language (which is important for the use of ICT) and finally, they have concerns whether ICT is leading to alienation and antisocial behaviour, because personal communication is changing and it is replaced (to a certain degree) by e-communication (Papavasileiou, 2007).

### ***The identity of the research***

This survey refers to the use of Information Communication Technology (ICT) in the In-Service Training Programs for teachers of Public (Primary and Secondary) Education both in Greece and Serbia, with respect to the differences of the way in-service training for teachers is functioning in the two countries. It is an empirical research using a comparative descriptive methodology. Its aim is to compare the teachers’ opinions concerning the use of ICT in the frame of their In-Service Training between the two countries. Data was collected during December 2009 and January 2010 through a questionnaire built for the purposes of this research and it contained ten questions –only one was open- and a four possible answers on a Likert scale. The sample consisted of 100 trainees-teachers of elementary and secondary schools -50 from Greece and 50 from Serbia, who live and work in big cities. We had 41 men (24 from Greece and 17 from Serbia) and 59 women (26 from Greece and 33 from Serbia).

## Findings

The majority of the teachers from both countries (82% for Greeks and 76% for Serbians) claim that they have a lot and enough experience in using ICT. This is important, as one of the basic conditions for using ICT (Koutsonikos, 2005). Still, we must have in mind that teachers in our sample come from bigger cities, so we cannot generalize this conclusion to village teachers. For the Serbian homes in general, we can say that the majority have computers nowadays, according to the data of the TIMSS -2007 study, where we can see that 77% of teachers have a PC, but only 47% of them have also the Internet connection (Martin et al., 2008). The great majority of the teachers in both countries (92% Greeks and 96% Serbians) are showing a surprisingly positive attitude towards ICT in general, meaning that attitude is not an obstacle for the use of ITC, as it often happens (Papavasileiou, 2007). Moreover, 90% of Greeks and 86% of Serbian teachers see ICT as very useful, or even necessary for their training purposes, with answers not differing for the two countries. But some Greek (18%) and Serbian (24%) teachers do not use ICT for the educational needs of their training. We can suppose that the reason is the lack of computer at home or at school. Teachers in the two countries reported a lot of different uses of the ICT: Power Point for making presentations, e- mail for communicating with professors and colleagues, Word to write essays, Excel and SPSS to make statistics and analyses, they also use programmes to design pictures, and create a website. Teachers use ICT in the class to watch and then analyze films with the children, to present the learning material, to find information they need or some material for the classes, to follow the changes of the law, for their own distance learning and self- education, for administration, writing reports, preparing teaching plans, etc.

**Table 1** Have teachers tried to improve their ITC skills in order to cope with the demands of their in-service training?

Answer	Greece		Serbia	
A lot/ Enough	15	30%	25	50%
Some/ Not at all	35	70%	25	50%

It is interesting to see that 30% of Greek teachers and half of Serbian teachers have improved their ICT skills due to their training. We can say that for Serbian teachers in-service training has been a great motive for ICT use, while for Greek teachers a good reason for using it. Teachers in both countries (74% for Greeks and 76% for Serbians) agree more or less that ICT has helped them in their training. At the same time in both countries, the great majority of teachers do not see ICT as a big obstacle for their further learning but still, a 10% of Serbian teachers have certain problems in using it. For Greeks, although 8% of them stated that they did not have any previous experience with ICT, still none of them named ICT as an obstacle.

**Table 2.** Do teachers use ICT in their teaching activities?

Answer	Greece		Serbia	
Always/ Often	16	32%	15	30%
Sometimes/ Never	34	68%	35	70%

Since we have learned that a lot of teachers use ICT for the purpose of their own learning and they do not have problems in using ICT, in general, it was expected to find them using ICT in their teaching

activities, too. But, from Table 2 we can see that 30% of Greek and 22% of Serbian teachers do not use it at all in the classes. Of course, not all schools have computers on the teachers' disposal and this is a strong reason not to use it in classroom (Kasimati & Gialamas, 2001). At the same time research has shown that teachers in their work in the classroom rely on the methods that make them feel secure and having control on the class (Mevarech, 1995) and they tend to use the methods that were used by their own professors and teachers. It is well known that ICT in education can be used in many ways: as medium in the managing of learning process (where we can use it for generating tests, evaluating results, keeping records, etc), it can also provide recommendation for further learning, it can be just a supplement to traditional learning process, or working tool without possibility to create and deliver materials, we can use technology to access the course, and it can be used "as a learning resource or a tool, as a tutor and as a subject to be taught." (Anohina, 2005: 91). In-service training though, should encourage the use of ITC in class work.

**Table 3.** Do teachers' use ICT to improve their professional knowledge?

Answer	Greece		Serbia	
	Count	Percentage	Count	Percentage
Always/ Often	26	52%	36	72%
Sometimes/ Never	24	48%	14	28%

In the era of constant development of science and technology it is necessary to stay in touch with the evolution in your field. One finding that was not expected was the use of ICT in teachers' job for the improvement of their professional knowledge, since almost half Greeks and one third of Serbians do not use ICT to attain professional knowledge, while they have stated they are able to and they do not have major difficulties in using ICT.

**Table 4.** Have teachers attained any personal improvement by using ICT?

Answer	Greece		Serbia	
	Count	Percentage	Count	Percentage
A lot/ Enough	28	56%	31	62%
Some/ Not at all	22	44%	19	38%

It is interesting to see how teachers perceive the influence of ICT on their personal improvement. From Table 4 we see that teachers in both countries say they have attained personal improvement. A 38% of the Serbian teachers claim that they have attained only some or none personal improvement by using ICT for the needs of their training, which could be interpreted that ICT educational practices used in the training programs are not always sufficient to cover their needs and expectations. Another reason could be the very short time that the training seminars last in Serbia. In Greece, the majority of teachers think that ICT has offered them a chance for personal improvement, which verifies their positive attitude towards the use of ICT but still, a 44% do not feel the same. Of course, it is strongly recommended to recognize the limits and the advances of ICT for achieving improvement and professional development.

## Conclusions

This research can be considered as a first indicator of how teachers that follow in-service training perceive ICT and how they use it in their learning in the two Balkan countries. Since our sample did



not cover all teachers being trained, we don't claim the research is representative for all teachers in Greece and Serbia. On the other hand, this research has provided some comparative descriptive data and the answers are rather similar in the two countries. Therefore, we can suppose that they represent the situation in the region, for the teachers of similar age, working and living conditions. From our results, we can see that teachers in both countries seem experienced in ICT use, they tend to have a positive attitude towards it, consider it useful and find ways to use it for their own training purposes and their personal and professional development and only partly for teaching purposes in classroom. The different ways ICT is used suggest that in-service programs can be enriched by providing many possible ICT applications, so to meet teachers' different needs and expectations in order to improve their own learning and work inside the classroom.

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# NEW TECHNOLOGIES AND CREATIVE LEARNING: EDUCATIONAL SOFTWARE AND EDUTAINMENT FROM STUDENTS OF PRIMARY SCHOOLS

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## Introduction

In Greece the first years of the 21st century, new technologies have entered strongly in the primary schools. On one hand the Greek Schools Network, which supports the provision of free internet access to schools and teachers<sup>1</sup> and on the other hand they trying placement in each class at least one computer with internet connection, help students and teachers have access to reach new technologies and exploit them in teaching. Besides the international experience shows that the introduction of telematique<sup>2</sup> services and internet educational software offers ability to utilize the strengths of contemporary pedagogical approaches<sup>3</sup>.

The entry of new books<sup>4</sup> in primary schools in school year 2006 - 2007, accompanied with CD make the students trying to find information from the internet, so they use new technologies and get to familiarize to them. On the other hand, lower prices on computers and Internet<sup>5</sup> use from various providers and upgrading of services and speed access to internet use, helped families to get access to new technologies. According to the National Survey on New Technologies and the Information Society in 2002<sup>6</sup>, one in three households owns a computer and two fifteen have internet connection, while in the field of training, the utilization rate reaches 32.3% (30% 2001).

Moreover, the spread of new technologies on public and private services has led to training of adults and especially teachers<sup>7</sup>, to enable to exploit them in educational process. This growth resulted in rapid increase of internet users not only to browse the web and find information, but also for communication between them. The social networking services, such as Facebook, aimed at creating on line communities of people with common interests and activities and have become very popular

<sup>1</sup> The Greek School Network is an advanced educational intranet of the Greek Ministry of Education which interlinks all schools, teachers and many administrative departments and supervised entities and it is internationally recognized as a valuable educational network that promotes the use of Information and Communication Technologies (ICT) in Greek Education, (<http://www.sch.gr>, 2009).

<sup>2</sup> The word telematique is created by French Simon Nora and Alain Minc in 1976 and implies the interconnection of telecommunications and computer science (informatique). The Integrated Services Digital Network (ISDN) is an example, (<http://egnatia.ee.auth.gr/~aalexioy/telematique.htm>, 2001).

<sup>3</sup> Panagiotakis Aggelos, (2005)

<sup>4</sup> <http://pi-schools.sch.gr/dimotiko>, (2006)

<sup>5</sup> <http://www.pi-schools.gr/press>, (2007)

<sup>6</sup> [http://www.go-online.gr/ereuna\\_2002.pdf](http://www.go-online.gr/ereuna_2002.pdf), (2002)

<sup>7</sup> [http://www.eye-ypepth.gr/epimorfosi\\_B/index.php?m=55&p=0](http://www.eye-ypepth.gr/epimorfosi_B/index.php?m=55&p=0), (2009)

nowadays<sup>8</sup>. According to European survey of on line habits “Internet & Mobile MC DC9” 63% of the Greek users have created profiles on a social networking service, while the European average is 45%. Indeed, a survey in 28 primary schools in Athens<sup>10</sup> found that eight out of ten students in fifth and sixth grades use a computer and 65% have Internet access, while 62% use a PC at home, 18% at friend’s house and only 22% at school. The social networks groups became rapidly very popular among young people and primary school pupils. In a survey conducted by Microsoft<sup>11</sup> found that a sample of 245 children (81% of them aged 14-18 years and 19% under 14 years), 61% say they have active participation in social networks websites. The survey results show that primary school children use new technologies more in their personal and social life than for educational purposes.

The purpose of this study was to investigate the effects of using new technologies to children at the sixth grade in primary school in their learning process. In addition, it studied the attitudes of students towards the use of computer and internet in class and it evaluated the programme. More specifically, the aims of the project was to familiarize students with the use of educational software and its use in school curricula to make their own edutainment and develop social and technological skills.

## Methodology

### Sample

Sample consisted of 25 volunteer students aged 12 years from two classes (12 and 13 students) at the sixth grade at the same primary school of the city Drama (a city in North Greece). The criterion for selecting the particular school is that it has an organized computer lab, an all day school<sup>12</sup> and therefore the students are taught new technologies.

### Evaluation Instruments

For the collection of data anonymous questionnaires were used to ensure openness and free expression question.<sup>13</sup> Before the research, to detect and avoid any difficulty in understanding the questions, the questionnaire was first completed by students in the sixth grade that were not participating in the programme.

**Knowledge questionnaire:** The knowledge questionnaire was closed type questions, it contained 16 questions, with a gradual difficulty. The questions were of multiple choice, with only one correct answer, and included the answer “I do not know”, which was helpful to extract further conclusions.

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<sup>8</sup> <http://www.dpa.gr/portal>. (2009).

<sup>9</sup> The data are derived from the European online search habits «Internet & Mobile MC DC», presented to members of the IAB Hellas (Interactive Advertising Bureau - Agency Interactive Communication). The research conducted by InSites Consulting in cooperation with the IAB Europe and 16 countries, including Greece, ([http://www.enet.gr/?i=news\\_el.article&id=100229](http://www.enet.gr/?i=news_el.article&id=100229), 2009).

<sup>10</sup> The research was conducted by the Unit Adolescent Health of B Pediatrics, University of Athens in collaboration with the Office of Health Education of Primary Education of A’ Athens and Action Information of Saferinternet.gr of the Greek Center Safer Internet, ([http://www.saferinternet.gr/files/2\\_Gkormas\\_SID2010](http://www.saferinternet.gr/files/2_Gkormas_SID2010), 2010).

<sup>11</sup> The survey was produced by Microsoft MSN in 11 countries in Europe (UK, Belgium, Holland, Denmark, Finland, Greece, Italy, Portugal, Sweden, Spain, Ireland) involving 14 181 people, offering interesting information on the degree of children and parents relationship in Greece regarding security issues, ([http://portal.kathimerini.gr/4dcgi/\\_w\\_articles\\_kath-break\\_1\\_09/02/2010\\_323206](http://portal.kathimerini.gr/4dcgi/_w_articles_kath-break_1_09/02/2010_323206), 2010).

<sup>12</sup> All day school attend children of working parents where they do their homework and other activities, (<http://2grpe.chal.sch.gr/olohmerosxoleio.htm>, 2009).

<sup>13</sup> Kampitsis & Harahousou - Kampitsis, (1999)

**Questionnaire of attitudes:** To explore attitudes towards the use of new technologies in class and to evaluate the implementation programme, there were used three scales, each containing 5 pairs of opposite adjectives<sup>14</sup> to a seven degrees scales at Osgood type<sup>15</sup>.

**Data collection process**

The project lasted two months (November and December 2009). Students participated in two hours a week and measurements were taken before and after the programme to record the final results.

During the programme the cooperative method was implemented and students of both parts were united and then divided into groups so that they can work together. Students collected information from the museum – kit,<sup>16</sup> titled “The twelve Ancient Greek Gods”,<sup>17</sup> the book of History of the third grade of the primary school, from an educational software prepared by some other students with the same topic<sup>18</sup> and from internet.

Then children were informed about the educational software, Hot Potatoes<sup>19</sup>, its educational value<sup>20</sup> and how to use it. Eventually, students through the educational software Hot Potatoes have created their own edutainment having ancient Greek Gods as subject and they put it on the internet<sup>21</sup>, to be used by other students.

**Design - Statistical Analysis**

To test the effect of experimental intervention t-test was used for dependent samples (Paired Samples Test):

**Dependent variable:** “evaluation of knowledge”

**Independent factor:** “method of teaching”

**Dependent factor:** “measuring time in two degrees”:  
 “pre” and “post”

<sup>14</sup> For me to use the computer in class is:

	much	quite	litle	so-so	litle	quite	much	
good								evil
boring								interesting
useful								useless
unpleasant								pleasant
important								unimportant

<sup>15</sup> Osgood, Tannenbaum & Suci (1957)

<sup>16</sup> The museum – Kits are bags from museums which are “traveling” from school to school, and they designed to bring the Museum closer to children and teachers, [www.ysma.gr](http://www.ysma.gr), (2009).

<sup>17</sup> <http://www.ysma.gr/Gr/ekpedeusi/mousioskeves.asp> (2009).

<sup>18</sup> Tixola, K. (2008)

<sup>19</sup> The Hot Potatoes is an open software programme that allows you to create different types of exercises for use either by internet or via computer. In reality, they are java scripts that created by a very friendly manner. The Hot Potatoes 6.0 consists of five sub-programs that allow the teacher to create a different type of exercises for different thematic areas of the curriculum, (<http://hotpot.uvic.ca>, 2009).

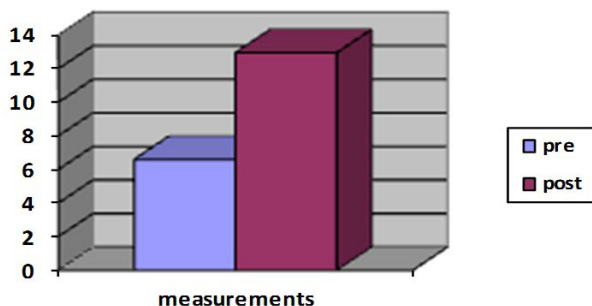
<sup>20</sup> <http://users.thess.sch.gr/salnk/didaskalia/Hotpotatoes.htm>, (2009)

<sup>21</sup> <http://utopia.duth.gr/~echarala/Dimitra.htm>, (2010)

## RESULTS

### Statistical results of the knowledge questionnaire

T-test was applied for dependent samples (Paired Samples Test). Between the two initial and final measurements. Statistically significant differences were found in the assessment of students' knowledge ( $t(24) = -10,80$   $p = 0,00 < 0,05$ ). Students improved their performance during the final test (see, Figure 1).



**Figure 1:** Averages of the performance of knowledge in both measurements

Furthermore, the frequency analysis (SPSS Frequencies) was applied for further conclusions. The analysis shows that some questions had big percentage of false answers or “not know” replies in the original count and the final were reduced significantly (see, Table 1).

**Table 1:** Indicative rates of false responses “do not know”

Questions from the questionnaire knowledge	9. Which of the ancient Greek Gods create earthquakes?	16. How God / Goddess associated four seasons?
<b>Measurements</b>	<b>Percentages of incorrect responses</b>	
pre	73,10%	23,10%
post	53,80%	7,70%
	2. How God/Goddess could be related to the alphabet?	15. Who is the God / Goddess born tragedy and the ancient theater?
	<b>Percentages of respondents “did not know”</b>	
pre	50%	3,80%
post	42,30%	3,80%

### Statistical results from the attitudes questionnaire

Scale of attitudes towards computers: To assess attitudes towards computers t-test was applied for dependent samples (Paired Samples Test) between the two measurements were statistically significant differences ( $t(24) = -4,351$   $p = 0,00 < 0,05$ ) improved their performance during the final measurement (See, Table 2).

**Table 2:** Averages and standard deviations

Measurements	Averages	N	Standard deviation
pre	5,5	25	0,9
post	6,3	25	0,7

Scale of attitudes towards the Internet: And in the assessment of attitudes towards the Internet applied t-test for dependent samples (Paired Samples Test) between the two measurements were statistically significant differences ( $t(24) = -7,860$   $p = 0,00 < 0.05$ ) improved their performance during the final test (see, Table 3).

**Table 3:** Averages and standard deviations

Measurements	Averages	N	Standard deviation
pre	5,2	25	0,9
post	6,4	25	0,6

Scale of attitudes towards the programme: And in the assessment of attitudes towards the Internet applied t-test for dependent samples (Paired Samples Test) between the two measurements were statistically significant differences ( $t(24) = -8,420$   $p = 0,00 < 0.05$ ) improved their performance during the final test (see, Table 4).

**Table 4:** Averages and standard deviations

Measurements	Averages	N	Standard deviation
pre	4,9	25	0,8
post	6,2	25	0,6

## Discussion – conclusions

The present investigation evaluated the teaching of a module with innovative methods such as cooperative learning and the use of new technologies in the classroom and the results found that students achieve better performance in learning and also through the construction of educational applications developed skills in using new technologies.

More specifically, students after the implementation of the programme they nearly doubled their performance (see, Figure 1) regarding to their knowledge of the ancient Greek gods and even to questions that require critical thinking. In questions related to key features of the Gods as symbols or their favorite plants and animals, students responded quite well to the initial measurement and doubled the answers to the final, while the response “I do not know” was little or nil. Also, in questions referred to special characteristics of Gods, the incorrect answers were more in the initial measurement and improved significantly in the final.

Nevertheless, some characterizations associated with more familiar figures of Gods, like for example the question “which God called winged”, the percentage of correct answers was high in both mea-

surements, because God Hermes is a trade mark of the Greek Post and generally is identified with transport and is known to students.

By contrast, other characteristics of the Gods that are not their symbols or questions asked to associate their Gods with modern symbols at a majority of incorrect responses and replies “I do not know”. For example, Poseidon is easily recognizable as the God of the sea, but the great majority of students either gave wrong answer to the question which God created the earthquake “didn’t know”, but they gave the correct answer later.

In reference to the relationship between students with new technologies, students were familiar with computers and the internet, because new technologies was a school subject. Furthermore, most of them had a computer at home, mainly to play games and they used the internet to find information and to participate in social networks groups (such as Facebook). Nevertheless, the attitudes of students towards the use of computer and internet for school classes were at the initial measurement were at low rates. But after implementing the programme, which combines information resourcefulness, cooperation and a constructive part of the new technologies, students got a more positive attitude (see, Tables 2, 3). Their attitude was more positive to the internet, because it was very important for them to put on their own educational software the internet. Regarding the evaluation of the programme, students changed their attitudes indicating this way their satisfaction to it (see, Table 4).

In summary, the purpose of this research was to motivate students to integrate new technologies into the learning development and to adopt positive or modify existing negative attitudes towards new technologies through active, cooperative and experiential teaching methods. Furthermore, children had the chance to develop cooperative skills and to realize of new technologies in relation to educational process.

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