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THE USE OF NEW INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE LEARNING PROCESS: A CASE STUDY OF SECONDARY EDUCATION IN THE PREFECTURE OF AITOLOAKARNANIA

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ABSTRACT: *Not only in the field of education but also in many other forms of social expression and action, a period of fundamental changes can be observed due to the incorporation of new data imposed by the technological revolution. However, the process of integrating Information and Communication Technologies (ICT) in the learning process requires coordination, system change and radical transformations. These changes should be incorporated into curricula, while active teachers should have ongoing training on new technologies. In such a context, this paper comes to explore the views of secondary education teachers on the use of information and communication technologies in the learning process. In particular, a sample survey was conducted to determine the degree of utilization of new information and communication technologies in the learning process, especially in secondary school teachers in the Prefecture of Aitoloakarnania. The statistical software SPSS 23 was used to analyze the data obtained from the questionnaires. Tools and methods of descriptive and inductive statistics were used. The results highlight the low percentage of teachers who have received Level B certification and demonstrate the low level of ICT use by teachers, identifying at the same time all the factors affecting negatively their use and application.*

KEYWORDS: Information and Communication Technology, Educators, Implementation, Certification.

INTRODUCTION

Our era could easily be described as the era of ICT. The introduction of ICT into education constitutes a tool for learning and teaching different subjects and objects, an information and communication tool in the management of a school unit and an autonomous subject (basic computer skills). Of course, the process of integrating ICT into the learning process requires coordination, changes of the educational system and radical transformations in the equipment of school units (hardware and software), changes of the network infrastructures and the institutional framework, and the production of appropriate educational software. The reasons for accelerating the integration of ICT in education vary. Initially, students can acquire an intense prevalent in society culture around computers which allows them to integrate into today's society more effectively. In addition, the complexity of the education system and the overall crisis make it necessary to integrate ICT into education as it can contribute both to the improvement of the learning process and the creation of environments that will help students develop specific skills and acquire new knowledge (Abbott, 2001; Livingstone 2012).

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In addition, the future professional progress of current students may depend to a large extent on their knowledge of information technology and, more generally, new technologies (Sandholtzetal, 1997; Solomonidou, 2006. Moreover, the introduction of new technologies manages to create new institutions and educational techniques, such as distance learning, an institution that began in the United States of America and developed at a very fast pace worldwide and in Greece managing in this way to provide vulnerable population groups (such as workers, mothers, people with mobility problems) with more attractive forms of learning (Pelgrum, 2001). In such a context, researches aiming at investigating the views of educators on contemporary issues such as the use of information and communication technologies in the learning process are of major importance.

THEORETICAL UNDERPINNING

Models of introducing ICT and the role of teachers in their implementation.

Internationally, there are mentioned three main models of introducing ICT into the educational process (Panetsos, 2001): the technocratic, the holistic and the factual. The main feature of the technocratic model is technological determinism that contributes great value to the information systems and the learning about their operation, aiming at their excellent use. The holistic model puts emphasis on the holistic and interdisciplinary cognitive approach. The introduction of ICT takes place gradually and finally it is integrated into all subjects. New technologies enrich almost all lessons and school activities. Adoption of this model causes a great reversal of the formal education system. Finally, a factual model is a combination of the two aforementioned. This model, on the one hand, is based on the teaching of purely Informatics courses and, on the other hand, uses new technologies as a means of assisting the teacher in the educational process.

The role of teachers in integrating ICT into teaching practice is vital. Teacher's particular features, such as computer self-efficacy, attitudes towards technology and the gender of the teacher appear to be connected with the use of ICT in education. This leads to the conclusion that, in order to understand the issue of the integration of ICT in the field of education, it is necessary to explore the attitudes and perceptions of the teachers themselves, since these are the main players in the educational process. In addition, it is interesting to study the factors that seem to influence their decision in relation to the degree of utilization of ICT (Bullock 2004; Paraskeva et. al, 2008; Shapka & Ferrari, 2003).

The role of the instructor should be that of preserving the characteristics of a learning environment which not only will provide students with new motivation but also will make them want learning. In addition, it should mediate and provide students with guidance, contribute to the organization and facilitation of school activities and enhance co-operation. In addition, it should also enable students to make their own initiative decisions about the knowledge they acquire and the way they can have access to it by warning, advising and motivating them. By regaining such a role, teachers help pupils get directly engaged in communication activities and they no longer focus only on the way pupils acquire knowledge. Instead they manage to emphasize greatly on teaching how knowledge emerges and how they can use it critically (Tsogianni, 2004).

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Teacher knowledge and skills

The use of ICT in the educational process presupposes knowledge and skills regarding teachers' side. However, as many surveys show, teachers' experience is a significant factor as far as the integration of ICT is concerned but experience itself is not sufficient. A key factor in assessing the use of new technologies and their integration into the educational process are teachers' attitudes towards ICT. Teachers' attitudes towards ICT integration compose a variable that incorporates teachers' perceptions of ICT, such as their views on their value and usefulness, and the ease of incorporating them into teaching practice. Elements of emotional dimension, such as anxiety or satisfaction with the use of ICT, seem also to shape and influence the behavior of teachers in relation to the use of ICT (Schoretsanitou & Bekyri, 2010; Albirini, 2006).

In Greece and in particular in secondary education, surveys carried out in the recent past highlighted the contribution of ICT to the educational process. In addition, they have shown that although a strong percentage of teachers have positive attitudes towards ICT, they do not seem to use them to the same extent in teaching practice, mainly because of their lack of competence. Of course, in addition to teachers' attitudes towards ICT integration issues, self-efficacy in computer use is also an important factor. Self-efficiency as a term is often found in research into ICT attitudes and is part of the cognitive dimension, according to motivation theories and in particular Bandura's socio- cognitive theory (Politis et al., 2000; Kassimati & Gialamas, 2001; Jimogianni & Komis, 2004; Kinigos, et al., 2000).

Research focused on the role of the teacher suggests that factors such as gender and years of service seem to influence the integration of ICT into the educational process as they are related to attitudes and perceptions of teachers. Research findings also indicate that teachers who count for many years in the service declare neutral or negative ICT integration. In addition, women appear to have low self-confidence in computer use and therefore retain less positive attitudes towards ICT and their integration into the educational process. However, according to Busch (1995), attitudes and self-efficacy are influenced by the computer use experience. In this sense, it cannot be concluded with certainty that factors such as the teacher's gender, years of service, or computer-related experience alone affect their use and inclusion in the learning process. Consequently, all factors should be considered in relation to the perceptions and attitudes of teachers (Schoretsanitou & Bekyri, 2010; Jimogianni & Komis, 2004).

METHODOLOGY

Research Aim

The purpose of this research is to explore the views of secondary school teachers on the use of ICT in the learning process. The individual objectives of the present study are:

- Assess the percentage of ICT certified teachers.
- Recognize the views of secondary school teachers on the inhibitors of the use of new technologies in the learning process.
- Explore the degree of integration of ICT into the educational process.

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Research Questions

The following questions represent both the main aim and the specific objectives of this research. Specifically:

- How many of the participants have received Level A certification?
- How many of the participants have received level B certification?
- Which factors affect negatively the use of ICT in the teaching process and to what extent?
- Do respondents' answers vary according to their age and gender?
- Which specialties use more the ICT in the educational process?
- Do certified teachers (level A and / or B level) use and apply the ICT more in their class?

Research Sample and Data Collection Method

The random selection of 108 permanent teachers of various specialties in the Prefecture of Aitoloakarnania was followed. The data collection was achieved through the completion of an anonymous questionnaire. This is a self-referencing method which is considered to be the most appropriate for collecting data on opinions, attitudes, beliefs and values (Robson, 2007). Respondents replied to an online questionnaire created in Google Forms. At the beginning of the questionnaire there were additional comments on the purpose of the survey. The relevant link to the online questionnaire was sent via e-mail and was requested to voluntarily fill it out. The duration of completion was estimated up to ten minutes. The collected information was coded and analyzed by computer with the SPSS statistical program, while the recording of the survey data and the reduction of its results in tables were created in order to make the result more understandable and clear. Each questionnaire had an introductory note explaining to respondents that the principles of confidentiality, anonymity and confidentiality of their personal data would be respected in accordance with ethics of conducting investigations.

Description of the Research Tool and Statistical Processing

This research was based on the questionnaire used by Koutsileou in her survey (2015). This is a valid and reliable questionnaire, consisting of three sectors:

- First sector: It contains five closed-ended questions dealing with general information related to the individual, demographic and professional characteristics of the teaching staff and whether they have received A and / or B level certification.
- Second sector: It consists of 7 questions in order to investigate those factors that negatively affect the use of ICT in didactic practice.
- Third sector: It includes 10 questions to capture the views of teachers on the implementation of ICT in the educational process.

The statistical software SPSS 23 was used for the analysis of the data. The tools and methods of descriptive and inductive statistics were also used. The description of the categorical data

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(demographic characteristics) was carried out with frequency tables - percentages, with pie chart and with bar graphs of percentages. The description of the hierarchical data (factors that affect negatively the use of ICT implementation) was carried out with percentage tables, percentage bars, minimum - maximum, averages , standard deviations and average bar graphs. In addition, the t-test, Mann-Whitney and Kruskal-Wallis statistical tests were used, with statistical significance $\alpha = 0.05$, in order to identify possible statistically significant differences between different demographic groups. Finally, the Cronbach 's Alpha level was higher than 0.7, score indicative of the satisfactory reliability of the question range.

Research Results

The sample consists of 108 permanent teachers of various specialties in the Prefecture of Aitoloakarnania. The total number of questionnaires collected was represented by both sexes, as 54.63% of the sample consisted of men and 45.37% were women. The majority of respondents belong to the age group 46-55 years with a percentage of 44.4%, while the percentages of the age groups 36-45 (22.2%) and 56-65 (20.4%) are similar. With regard to the factors that negatively affect the use of ICT in teaching practice, the following are observed (table 1).

Table 1. Factors that negatively affect the use of ICT in teaching.

S/N	Factor	A lot (%)	Agree absolutely (%)	Neither agree nor disagree (%)	Disagree (%)
6	It takes a long time for the teacher to prepare and organize the teaching intervention.	26,9	36,1	25,9	11,1
7	Teachers' knowledge about the use of new technologies is incomplete.	33,3	40,7	25,9	-
8	There is no training for all teachers in this field.	37,0	25,9	37,0	-
9	Teachers are not supported at a technical level (inadequate logistical infrastructure, access to the Internet).	32,4	45,4	22,2	-
10	There is no support for educational efforts in the process of using ICT in the learning process (eg teacher mentor, learning communities).	38,9	36,1	25,0	-
11	The degree of support, promotion & empowerment of teachers' efforts to integrate ICT into the learning process by the school leadership is small.	54,6	22,2	23,1	-
12	The teaching time required to implement ICT teaching scenarios is large (or small the margins in the traditional curriculum).	33,3	26,9	39,8	-

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It is clear that respondents believe that all these factors have some influence on the use of ICT. The only exception is "Requirement of a long preparation and organization of teacher intervention", where 11.1% of respondents disagree.

Regarding teachers' answers to ICT implementation issues during the teaching process, it seems that teachers "evaluate educational software in terms of pedagogical value", "use web technologies and Web2.0 applications" and "create computer printouts" at a higher frequency. At a lesser frequency, "use projector and / or PowerPoint" and "use office applications". Gender does not seem to statistically affect the degree of ICT implementation. In contrast, the shorter the respondents' age, the greater the degree of ICT implementation in the classroom ($p = 0.009$). Similar is the conclusion for teachers with lesser experience ($p = 0.000$). Also, IT teachers use ICT more, while philologists and science teachers less and even less the other specialties ($p = 0.000$). Finally, teachers with A 'or B' level certification are more likely to apply ICT to class ($p = 0.000$).

CONCLUSIONS

A first general conclusion resulting from the data analysis is that although the highest percentage of teachers have received Level A certification (76.9%), they have not received Level B certification (78.1%). This shows that the majority of teachers have not been certified or trained in issues related to Internet technologies and collaborative learning tools, as well as educational software incorporating individual learning theories. A second important conclusion is that all aforementioned factors have a large negative impact on the use of ICT in the teaching process. It should be noted, however, that the highest cumulative percentage (77.8%) of those who stated that they agree very much or totally is the teachers' belief that technical support and benefits are inadequate. Logistical infrastructure and access to the Internet are also inadequate.

Another important observation that came from the Kruskal - Wallis statistical test is that younger age groups consider to a lesser extent that "the teacher has a great time to prepare and organize teaching instruction" and that "the teaching time required for teaching ICT scenarios are large "($p = 0.006$ in both cases). As far as the degree of ICT implementation is concerned, teachers are more likely to "evaluate educational software in terms of pedagogical value", "use web technologies and Web2.0 applications" and "build their printed material through a computer". On the other hand, they are less likely to use "projector and / or PowerPoint for presentation of teaching" and "office applications". Regarding the influence of demographic characteristics, gender does not appear to affect statistically the degree of ICT implementation in the class. This finding is opposed to the findings of earlier surveys (Schoretsanitou & Bekyri, 2010). On the contrary, the age group affects the use of ICT. Specifically, the shorter the age group, the higher the intensity of ICT in class ($p = 0.009$). The conclusion for teachers with lesser experience is similar ($p = 0.000$). Finally, IT teachers and A 'or B' level certified educators are more likely to apply ICT to the classroom. As can it can be seen from the analysis of the data, it appears that the degree of integration of ICT into the educational process is not at a desired level. There is therefore a need to create incentives and the right conditions to encourage teachers to make the most of ICT use.

Proposals for Further Research

Research results show that one important parameter that should to be seriously considered in future research is how to motivate teachers to further exploit new technologies in the classroom.

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As there is a relative deficit in the bibliography, a future research and indeed qualitative would generate new knowledge (Creswell, 2011). Investigation based on qualitative criteria could focus on the factors that affect negatively the use of ICT. At the same time, research in this field would help to the development of updated models of teacher education on ICT use in teaching. Some other factors that could be investigated are the logistical infrastructure, the suitability of educational software and the support of teachers from the wider environment of the school. In conclusion, it should be noted that the results of this survey cannot be generalized as it has been carried out in a single county. However, its findings could be a reason for reflection and a reason for a future survey at national or regional level with a much larger sample.

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