

ICT AS FOUNDATION FOR AUTONOMOUS LEARNING IN A GREEK PRIMARY SCHOOL

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Abstract

This study takes place in a Greek Primary School. It investigates the possibility to promote autonomous learning, as a new learning paradigm, through Information and Communication Technologies (ICT). This is done by answering whether the pupils: (a) became motivated to use ICT for learning purposes, (b) used ICT to gather resources about concepts and units of curriculum subjects, and (c) used ICT to apply or develop managerial skills. These are abilities of autonomous learners. The conclusions show that pupils managed to learn to use the ICT through a self-learning perspective; however, more has to be done.

Introduction

The development of modern technologies and the Internet have caused drastic and unpredicted reforms in many social fields, including education. Frizler (1995) purports that there is a link between effective ICT and teachers' ability to change their roles and attitudes toward teaching. New ideas around teaching and learning are developed. Such is the idea of promoting autonomous learning through ICT.

Autonomous learning is considered important, since it helps learners engage themselves with continuous knowledge question and acquisition as pupils and later on as adults. Many theorists and educators consider it an appropriate supplement or even substitute of the dominant model of direct instruction in teaching. In order to promote this learning paradigm, schools have to help learners develop specific skills (Luzon & Gonzales, 2006).

Within this framework of ideas, this study was designed. The context was a public primary school in Greece, where a new institution, the 'Clubs' was introduced during the academic year 2012-2013. Teachers of the Clubs have the option to promote approaches and ideas outside the strict, restricting curriculum (Zambeta, 2000; Law No. 3699, 2011). This was seen as an opportunity to use ICT as means to promote and develop autonomous learning skills.

The Greek Education System however, is considered by literature to be highly resistant to innovations as this (Zambeta, 2000).

The principal question emerging is whether it is possible to develop autonomous learning, with the help of ICT, in the particular context, by taking advantage of the flexibility provided in the Clubs. In that respect, it was investigated whether: (a) the learners became motivated to use ICT for learning purposes, (b) the learners used ICT to gather resources about concepts and units of curriculum subjects, and (c) the learners used ICT to apply or develop managerial skills. These three points reflect autonomous learning promotion through ICT (Luzon & Gonzales, 2006).

Autonomous Learning: Theory, Application and Links with ICT

According to Holec, (1981) autonomous learning has to do with a person's ability to take full responsibility of his or her own learning. That includes the ability to decide what, when, how and for how long learning should take place. This involves defining goals and objectives, selecting appropriate materials, techniques and approaches, and finally evaluating outcomes. Teachers should help learners develop the appropriate skills, so that they will become increasingly autonomous in what concerns learning.

These autonomy-friendly skills can be developed, if the sessions or activities that learners engage with have four basic characteristics. The first is motivation. The topics of the activity must be linked to learners' interests, needs and talents. It also has to challenge learners to deal with everyday life issues, familiar to them. The Web can help in identifying learners' interests as well as issues linked to their experience. Digital images, videos, and spreadsheets can also help (Wilson & Boldeman, 2012).

The second characteristic is integration with the wider learning goals of the curriculum. This will help combine the learners' needs and learning objectives as set by the curriculum, which should keep being acknowledged to them. This way, learners do not distance themselves from the academic context of the school. Again the Internet can assist, with its wealth of learning activities and software.

Luzon and Gonzales (2006, p. 182) call the third characteristic *learner-centeredness and scaffolding*. Indeed, if a session is teacher-centered, learners would consider learning as a passive process, where they only have to absorb any knowledge the teacher presents, without critical thinking. Developing responsibility, learning attitudes and skills under these circumstances is very difficult. To avoid this, the teacher should provide learners with: (a) instructions on how to construct knowledge, (b) resources to use, and (c) assistance to choose the most appropriate path to learn. ICT can be beneficial in doing this as well, by providing information and producing material for teaching or assessment purposes.

The fourth characteristic is the development of managerial skills and strategies such as seeking data, evaluating, concluding and disseminating. The Internet can help at that point too, as it offers opportunities for information and

exchange of ideas between learners, teachers and others. Data loggers, simulators and software that can engage learners with research tasks can also help (Luzon & Gonzales, 2006).

Tian (2012) has pointed out basic abilities of autonomous learners. First, autonomous learners are motivated and confident. Second, their learning is focused on duties, which may relate to school curriculum subject or to the accomplishment of a project. Third, they can collect, evaluate information, and present their knowledge they have constructed. All these abilities can be helped by ICT, through searching on the Web and gathering, analyzing, presenting and disseminating information. These basic abilities are going to be the main axis of this study. The central idea is to investigate how ICT can assist in the development of these abilities in a particular context.

Evaluating ICT-based Teaching Practices

Evaluating progress and outcomes of teaching instructions based on ICT, is a complicated procedure of long duration. Oxford (1993) argue that using ICT in teaching can be effective if it responds to the interests, needs and difficulties that learners may encounter and if it is used in contexts where application is apparent. For effective evaluation to take place it is important to select the appropriate *indicators*, which Sander (1997) defines as pieces of information that demonstrate, communicate and disseminate a state, trends, progress or warning to a specific audience. Numerous indicators have been suggested, for ICT-oriented instructions.

Kozma and Wagner (2005) note that any session using ICT usually aims to increase learners' knowledge. They point out that frequently the evaluation of the effectiveness of these courses comes by self-report processes, such as asking teachers, learners and people involved. These indirect indicators can give evidence about the progress of the session, but they are not always considered to be very reliable. There are others, more direct that are thought to be more valid, such as national or international assessment tests or customized program-oriented tests. Direct indicators face criticisms too though, for being too focused on cognitive issues, and do not offer a holistic view of the teaching process, leaving aside skills and attitudes.

Each indicator has advantages and disadvantages. The suitable ones have to reflect the aims and goals of the study. Specifically, they need to be linked with the school and learning context. They should also be flexible, as the orientation and aims of the study can change. Lastly, there should be a variety of them, to assure greater quantity and accuracy of data and conclusions (Peterson, 1999; Wieman, Gast, Hagen, & Van der Krogt, 2001). These principles will be used in order to select the appropriate indicators for the project.

The Research Project

The School Context and the Clubs

As indicators should take into consideration the specific school context, it is useful to point out its' main characteristics. The project takes place in a Greek

public primary school with 15 teachers and 180 pupils. During the academic year 2012-2013, a new institution the 'Clubs' was introduced, in accordance with Law 3699/2011 (p. 45), aiming to "promote subjects as mathematics, science, language, literature and other fields such as the arts, sport, etc., to create nuclei of creativity and excellence that leverage the talents of some pupils, without compromising their socialization." The specific schools run Clubs of Mathematics, Environment, Reading, Digital Literacy and E-twinning. A total of 75 pupils participate in one or two of them.

These were pupils of the fifth and sixth grade of primary school. As required by the law, they have been selected after applying and having undergone a selection procedure that included a general exam and interview with learners and parents. In school, these learners study Greek, mathematics, science, history, religion, arts, music, foreign language and physical education. Teachers in Greek schools are expected to follow the strict teaching packages distributed from the central Ministry, which include teachers' books and detailed instructions about what topics to teach, what textbooks to use and what approaches to apply (Law No. 3699, 2011).

In the Clubs though, teachers could choose their goals and approach. The Clubs were an opportunity to implement paradigms not promoted by the curriculum.

According to the theory of multidimensional intelligence developed by Gardner (1983), the main axiom of the operation of educational institutions, programs, or activities such as clubs, is to promote skills and talents and the interest of learners. These may relate to specific skills: linguistic, logical-mathematical, spatial, musical, figural-spatial, bodily-kinetic-and interpersonal communication. The introduction of such institutions may include actions as: planning activities, interdisciplinary and trans-disciplinary approaches, student work (projects), assessments and practical learning exercises (Wilson & Boldman, 2012).

The decision to promote autonomous learning with the help of ICT came as an inspiration from influences of modern pedagogies (Luzon & Gonzales, 2006).

Processes of Educational Change in Greece: The Myth of Sisyphus

The tale of Sisyphus comes from Greek mythology. Sisyphus according to Homer was a wise and prudent king who had stolen the secrets of gods and he had been condemned to roll ceaselessly a heavy rock to the top of a hill. But when reaching the top, the rock would roll down and Sisyphus would have to push it up again. The myth is tragic as its hero is a conscious human, exerted to accomplish nothing.

The Greek education theorist Kazamias (1990) illustrated that a curse - similar to the punishment of Sisyphus - follows every attempt for educational reform, in Greece, making it an endless, long, unsuccessful and incomplete effort. Despite the recognized need for change, the expectations, the rhetoric and the

intensions, the Greek educational system, has a unique way of returning to the past, again and again. This simile has three dimensions: the political dimension, referring to the bureaucratic and centralized nature of the Greek state; the cultural dimension referring to school's autonomy; and the socio-economic dimension. Over the years several change forces have risen in Greek society, such as globalization, ICT advances, influences from research, new learning paradigms and directions of the European Community. The need for innovation is recognized, but the education system resists (Zambeta, 2000).

In most European systems, progress among education levels is done through different paths. In Greece this process follows generally a vertical one-way process, where each level of the education scale acts as a preparatory stage for the following. Social rewards and prestige are strongly related to educational attainments. People aspire that their children will attain the highest possible education level.

Reforms focusing on modern learning approaches and pedagogies do not seem to be of much interest unless they are associated with the intensive preparation of learners to face a highly competitive environment at the secondary level. No matter how useful the reform might be, it is expected to fail if the system orientation remains exam-centered, centrally designed, and based on traditional ways of transferring, rather than constructing, knowledge (Kanellopoulos & Psacharopoulos, 1997).

This creates concerns about the effective promotion of a new paradigm in a Greek School, such as autonomous learning through ICT.

The Research Design

The study tries to answer if autonomous learning can be promoted with the help of ICT in a Greek School. Teachers took advantage of the option given within the Clubs to decide what and how to teach. This was to be accomplished through several tasks or activities of different range, subject and goals. There was a variety of activities, either individual or group. Their themes belonged to one of the following categories:

- Search information about an author, a scientist, a place, a book.
- Investigate a kind of software and then present it to others.
- Create and maintain a blog.
- Teach or explain further a unit from a subject of the school to others.
- Search general ideas about school functions or event planning.

These activities included presentation of how ICT could help learning. There were suggestions of search engines, websites, applications such as Microsoft office, and software based on the school curriculum units. Selection was based on the available school equipment. Learners were given the opportunity to practice and revise it.

During planning, implementation and evaluation of each activity, emphasis was paid on developing the four basic characteristics of autonomous learning promotion: creating motivation, linkage with mainstream curriculum subjects,

learner-centeredness and managerial skills (Frizler, 1995; Luzon & Gonzales, 2006). This had to be adjusted to the school context (Peterson, 1999).

In order to promote motivation and confidence, there was thorough demonstration of how ICT can help self-learning. During each activity, learners were shown how to seek information from websites and how to use applications to learn.

In order to promote the integration with subjects of the curriculum, the previous demonstrations would focus on particular kind of resources and applications that were relevant to the subjects, the units and the concepts taught in other subjects.

In order to promote the development of managerial skills, learners would engage in relevant tasks, which certainly included the use of ICT. The extent of the study, the age and level of learners in combination with the mainstream curriculum general guidelines for elementary school pupils lead to a selection of certain skills. These were resource analysis and evaluation, data organizing and dissemination. So, ways of organizing, evaluating and presenting data with ICT were demonstrated. Emphasis was given in documents, spreadsheets, presentations.

Generally, it was planned that in the beginning of the course teachers would show the learners how to carry out these projects. During the course however, learners would be getting less guidance so that in the end they would be able to carry out similar projects on their own (Cohen, Manion, & Morrison, 2000; Wilson & Boldman, 2012; Tian, 2012).

The Research Questions

The main points around autonomous learning promotion, as well as the assistance of ICT in that direction have been described. It was also noted that there are various indicators used to evaluate ICT-based teaching and there are guidelines to select the most appropriate ones (Peterson, 1999; Kozma & Wagner, 2005).

The basic idea in this project was that the research questions will determine if ICT, within the specific school context can accompany the development of abilities that qualify a learner as autonomous: motivation and confidence, integration with subjects of the curriculum, managerial skills

Research has supported that this is possible (Luzon & Gonzales, 2006; Tian, 2012). The challenge is to apply it in a school that works in a context unwelcoming to reform and innovation such as the Greek Educational System (Zambeta, 2000).

To form the research questions, in that respect, it is necessary to check which indicators, fit better to an ICT-friendly learning intervention that promotes the basic abilities of autonomous learners. In Greece there are no national tests at primary school level, the indicators used could only be indirect. The most appropriate questions, as derived from this benchmarking and filtering were:

1. Did the learners become motivated and confident to use ICT for learning purposes?
2. Did the learners use ICT to gather resources about concepts and units of curriculum subjects?
3. Did the learners use ICT to apply or develop managerial skills?

Emphasis was given on two points. The first is the progress in the particular skills as observed throughout the year. The second was the autonomy of the learner and the degree of assistance required from the side of the teacher.

This study mainly investigates contexts and human behaviors. The issues being investigated, motivation and confidence, integration and development of managerial skills are not easy-to-assess with standardized tests or measurements. For that reason, the qualitative enquiry seems more appropriate. Qualitative researchers seek illumination, understanding and extrapolation.

Action research was the most appropriate for this study, as there is researchers' personal involvement as teachers in it. Action research involves reflection, collaboration and dialogue as elements of an empirical research (Cohen et al., 2000).

Throughout the whole study duration, data were collected through: documents; learners' projects and notes; observation of learners while working, reading and discussing; and interviews with learners and parents (Bell, 2001).

The development of the basic skills in all sessions was observed. At the same time learners participated in many semi-structured interviews.

Data to answer the first research question were given by learners when answering questions such as: "Why would you use the internet generally?" "What do you think you can do to get information about that topic?" "Would you use the Internet?"

Data to answer the second research question were given by learners, when answering questions such as: "Where can you find more information about the topic you were taught?" "Can you help your classmate understand better what you were taught today? Do you think the computer would help you?"

Data to answer the third research question were given by learners when answering questions such as: "How would you be sure that what this site writes is true?" "How can you find more information about it?" "What do you think you can do with all these information you have gathered?"

Data that came from interviews and observations were triangulated with learners' pieces of work and with unstructured interviews with parents. This was expected to provide more accurate data and conclusions (Cohen et al., 2000; Wieman et al., 2001).

Findings

Table 1

Findings

Research questions	Research question 1: <i>Did the learners become motivated and confident to use ICT for learning purposes?</i>	Research question 2: <i>Did the learners use ICT to gather resources about concepts and units of curriculum subjects?</i>	Research question 3: <i>Did the learners use ICT to apply or develop managerial skills?</i>
Positive findings	Learners were very motivated.	Learners started using ICT to learn things in relation to their curriculum subjects.	Learners became familiar with analyzing and presenting data.
Negative findings	Confidence was not that apparent.	The interest in learning about topics out of their interest was rather limited.	They did not seem familiar with organizing data and planning actions.

Research question 1: “Did the learners become motivated and confident to use ICT for learning purposes?”

With regards to first research question findings show that there was partial progress.

In the beginning of the course most learners had explained and demonstrated that they only considered the computers and the Internet as part of their amusement. Indeed, when first asked about the main activities they do with the computer, the majority of learners gave answers such as visiting sites with online games, sport news, movies and series, social networking, electronic communication with friends. Only a limited number of learners answered that they also use the Internet to search information about a hobby of them. This changed drastically throughout the course though. Data from observations, interviews with learners and parents as well as samples of pupils’ work show change. As time went on, an increasing number of pupils showed that they started using the computer in order to learn new things.

When it comes to confidence though, results were not equally positive. Although most learners expressed and demonstrated assurance that they can use ICT to learn new things for school, there was still a considerable number that expressed disbelief in their ability to do so, showing concern about adopting new ways of learning, based on self-responsibility.

This finding proves literature claims about the assistance offered by ICT. In the case of this study, which has to do with the use of ICT to form potential autonomous learners, this is very important. It shows that ICT can be linked with the motivation for learning (Luzon & Gonzales, 2006; Tian, 2012). The lack of confidence might be attributed to suspicion about new learning paradigms (Zambeta, 2000).

Research question 2: “Did the learners use ICT to gather resources about concepts and units of curriculum subjects?”

With regards to the second research question, the results seemed encouraging, depending though on the tasks’ context and nature and learners’ interests. On one hand, there was a rising interest from the most learners to use the computer to learn more things about what they studied at school, especially in specific kinds of tasks. Some of these could include narrating historical events, experiments, and myths. Others could include more hands-on activities such as learning to prepare video using particular software, or learning to do a construction in arts. There were also a number of learners who started visiting websites with supplementary exercises, in grammar, mathematics, science or history. On the other hand, this interest was not always existent. Only a few showed equal interest in almost all projects of all subjects. Most of them restricted it in tasks linked to subjects they explicitly clarified from the beginning they like more.

These findings come to prove that ICT can assist in the qualifying of autonomous learners (Luzon & Gonzales, 2006; Tian, 2012). The pre-existing restricted interest and focus can cause concerns, as the overall study aim does not desire autonomous learning skills to be limited in certain subjects but expanded to all (Peterson, 1999).

Research question 3: “Did the learners use ICT to apply or develop managerial skills?”

Within the third research question the results showed progress in several ways. Indeed, there were an increasing number of learners that got more used to visiting various websites of similar or different contexts, in order to collect, compare, assemble the information they needed. The results were not encouraging when it came to organizing skills, however. Learners could not use ICT to organize and plan their actions independently and highly relied on teachers and instructors on such tasks, even at the end of the course. The positive sign was that learners by the end of the course were agreeing that ICT offered the possibility to do that, whereas in the beginning this was rather unknown to them. In some cases, they even described ways of using ICT to organize and handle data, even though they had difficulty in applying it. It was sometimes unclear though if this was actually understood or if they were just repeating passively something they had heard.

There was significant progress in using ICT to disseminate and present pieces of work. Learners who knew little about presenting information or the possibility of ICT to assist became familiar with relevant applications and software. They kept asking for opportunities to present their work to other pupils. In fact, in the beginning, the files or slides and pieces of work, they were presenting, were relatively simple, with small sentences and few pictures. By the end, they were more complicated, with images, videos, texts and animation effects.

So, learners got familiar with collecting, accumulating, comparing and presenting information obtained by using ICT, as was expected (Luzon & Gonzales, 2006). Learners did not become very confident to organize and plan out such activities on their own. This might be due to the persistence of

the direct instruction approach, to which learners are exposed in most other activities (Zambeta, 2000).

Conclusions

Any level of freedom provided to teachers to design sessions and work can be highly beneficial for the school (Biltitude & Sardo, 2012). Within this context teachers can integrate new trends such as ICT in activities with an aim beyond the established curriculum. Such an aim might be the promotion of autonomous learning (Tian, 2012).

As far as the project is concerned, learners seemed to be motivated to use ICT for learning purposes and got familiar with collecting, analyzing and evaluating information online. However, they were not found to be very confident. They did not seem to link with school subjects and there was difficulty in data organizing. This could relate to the factors that prevent reforms and new paradigms to flourish in the Greek educational system (Zambeta, 2000). That can be a topic for further study.

Overall, though, it is evident that progress has been achieved. Pupils gradually start taking greater responsibility of their learning and decide what means, resources and plan can help in that direction (Luzon & Gonzales, 2006).

Before making any generalizations from these conclusions, it is essential to point out limitations of the study. The population includes participants from a typical Greek primary school during one academic year. It was perhaps the most appropriate considering the goals, time and place restrictions. However, it is not large enough to make the findings adequate for accurate generalizations or definite future predictions (Cohen et al., 2000).

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