Comparative Evaluation of Internet Based Distance Education in the Greek Higher Technological Education during the Period 2007-2010

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Abstract—The rapid development of Information and Communication Technologies (ICT) has a significant influence on many sectors of everyday life and consequently on education. As part of the current research, a comparative evaluation of the use of e-learning systems (Internet Based Distance Education) in Greek Higher Technological Education (TEI & ASPAITE) was conducted through their official websites during the period 2007-2010. The key aim of this research is to enhance the image that prevails in practice by using e-learning systems in Higher Technological Education. The survey was conducted using a suitably shaped Gender registering data through accessing the official websites of all Greek educational institutions. In Internet Based Distance Education, Internet provides a variety of tools for the creation, the organization and the management of courses. However, there is not a fixed standard to guide the design and the supply of these online courses. The effectiveness of the new Internet tools as well as the educational framework, within which they will be used, constitute major fields of study. Furthermore, promoting the development of e-learning systems within the Greek Higher Technological Education during the period of the survey, helps us to draw useful conclusions for the development of the institutions’ infrastructure, as well as evaluate the educational process through the Internet in the near future.

Index Terms—Web based Education, Evaluation, Higher Technological Education

I. INTRODUCTION

Nowadays, more and more Higher Educational Institutions upload lectures, exercises and supplementary material in the web in an effort to enrich and complement their teaching methodology, even though the quality of the material often varies ([4], [5]). Several e-learning systems of synchronous or asynchronous education, as well as distance learning courses offered by these systems, focus only on content presentation, providing few opportunities for interaction and active learning. The majority of the current e-learning systems often adopt the general model of “one size fits all” (one-size-fits-all), without taking into account each student’s diversity [6].

Within the framework of the current research we create and implement a Framework of Research Systems based on what we present an overview of the scope of the Technological Educational Institutes (TEI) and the School of Pedagogical and Technological Education (ASPAITE). This article follows our previous research [7] and constitutes a comparison between the current situation (2010) and the one in 2007 regarding Internet Based Distance Education in the Greek Higher Technological Education.

II. METHODOLOGICAL RESEARCH FRAMEWORK – QUESTIONS

The main research problem is the outline of the new environment that has arisen with the introduction of Internet Based Distance Learning in the Greek Higher Technological Education. The purpose of the current research is the recording and analysis of e-learning systems (platforms of synchronous and asynchronous learning such as Moodle, Learning Space, WebCT, e-Class, etc.) used in TEI and ASPAITE through the official websites of these institutions. In particular, the research focuses on the study of fifteen (15) Greek Technological Educational Institutes of Higher Technological Education (in Athens, Piraeus, Thessaloniki, Patras, Lamia, Chalkis, Larissa, Western Macedonia, Kavala, Mesolonghi Kalamata, Crete, Epirus, Ionian Islands and Serres) and the ASPAITE.

The research is initially qualitative-thematic aiming at describing and then analyzing, interpreting and understanding events and situations. In this research the new environment that has arisen with the introduction of Internet Based Distance Learning in the Greek Higher Technological Education is outlined. The survey was
conducted through the official websites of TEI and ASPAITE in two different periods in 2007 (October and November 2007) & 2010 (March 2010) and includes the following features:

Characteristic: $X_1$
Characteristic: $X_2$
Characteristic: $X_3$

................................
Characteristic: $X_n$
so Characteristic: $X_{in}$

where $n$: the total number of features of this research.

The main research questions are the following:

QUESTION-1: To what extent are the technical and educational possibilities of the e-learning systems used by the teachers?

QUESTION-2: Are communication networks among the members of the educational community established and, if so what kind of networks are they?

QUESTION-3: Are e-learning systems in the laboratory subjects being used because of the technological nature of these institutions?

QUESTION-4: Is there any particular preference in an Internet Based Distance Education System?

QUESTION-5: Is there a single strategy regarding the use of Internet Based Distance Education Systems in these institutions?

QUESTION-6: Is Internet software used to support the educational process?

QUESTION-7: Are classes of synchronous education used?

For the study and recording of Internet Based Distance Education Systems based on the relevant field bibliography ([3], [4], [6], [8], [9]) the following 7 levels have been developed:

LEVEL I: Selection of Recording and Analysis Characteristics: This option aims at imprinting and analyzing the educational content, as well as the technological and geographical characteristics that constitute the Internet Based Distance Education Systems currently used in TEI and ASPAITE. The proposed analysis is applied in offered courses that highlight their educational function. The characteristics studied are divided into the following 3 main categories:

(a) Characteristics of the Educational Program (CEP): are the data related to the internal structure of the offered courses by Internet Based Distance Education Systems (regardless if it is a primary or supplementary course). The characteristics EP1-EP15 are recorded for the open courses since there is no access in closed courses.

(b) Technical Characteristics (TC): are the characteristics of technology management of the educational program offered in Internet Based Distance Education (the features TCX1 and TCX4 are recorded in the open courses.)

(c) Geographical Characteristics (GC): are the characteristics that define geographically the applications systems of Internet Based Distance Education in TEI and ASPAITE.

The answers to the above mentioned characteristics of this research (CEP, TC, GC) vary depending on the type of the characteristic (yes/no, numeric value, description) and a schematic Research Framework of e-learning Systems (RSF) is described in Figure 1 as follows:

LEVEL II: Construction of the Record Sheets (RT). At this level the RT has the form of a printed record of the characteristics mentioned at Level 1 and other general data that help research and data collection.

LEVEL III: Sampling Methodology. At this level the design of the methodology of sampling is conducted. The design concerns the way of taking a sample from the internet through the official websites of the participating TEI and ASPAITE and recording them into the respective Record Sheets. The 16 official websites of TEI & ASPAITE, which were also linked to distance learning courses and could be accessed through the TEI and ASPAITE homepages, or even the website of each department or both, constituted the research sample.

LEVEL IV: Recording the characteristics of Internet Based Distance Education Systems. At this level the research is conducted by examining every site of TEI and ASPAITE and recording the answers in the corresponding Recording Sheets.

LEVEL V: Qualitative analysis of data recorded in Recording Sheets. At this level, we should calculate the quality equation $E_{CEP(IBDE)}$ for each Technological Educational Institute and ASPAITE, which equals to $E_{CEP(IBDE)} = E_{CEP} + E_{TC}$

LEVEL VI: Comparative Analysis. At this level the comparative analysis of the research findings is conducted regarding the equation $E_{CEP(IBDE)}$ and the individual equations of the characteristics of the categories (Characteristics of the Educational Program (CEP), Technical Characteristics (TC)).

LEVEL VII: Description - Analysis of research questions. At this last level answers will be given through the qualitative data analysis using the preceding 6 levels of assessment with the key research questions (QUESTION 1 - QUESTION 7) as reported in the methodological part of this article.

III. FINDINGS-RESULTS

In this presentation of the first mainly descriptive research findings, we will refer to the last level of analysis (VII). Specifically, when analyzing the research questions, raised in the methodological part of this article,
we attempt a first recording of the platforms utilised in TEI and ASPAITE.

In response to Question 1, based on the data recorded on the Recording Sheets, the Characteristics of the Educational Program (CEP) and the Technological Characteristics (TC), as well as their comparative analysis, we assume that a large number of institutions make significant use of the technical and educational opportunities that e-learning systems offer. However, what was systematically noticed is the use of many features without being fully activated or updated. Additionally, the educational material was found to be either repetitive or very poor. Furthermore, the use of multimedia is recorded, even though it is still at a basic level (eg, presentation software, photographs, drawings, images) without often using animation, video and educational software. Many offered modules are limited to simple texts using few media means (images, shapes, etc.). This indicates that the contractual organization of courses was simply digitized into e-learning systems (Web based Education) without changing or upgrading its structure with the use of Information and Communication Technologies (ICT) in Education.

Similar findings are observed when using video lessons and video material, as well as in virtual laboratories. The courses offered have the form of providing additional educational material for complementary use by the learner. From 2007 to 2010 there was no significant progress in terms of organizing the courses, expanding training materials and using advanced educational tools, such as simulators, virtual laboratories (real time, on-line) and educational software. The situation remained stable without any radical positive changes, despite the funding from the European Union within the framework of the 3rd EPEAEK CSF. It is evident that there is casualness regarding the courses organization and lack of new technologies management in teaching from the institutions. Moreover, there is lack of the quality and quantity of educational material, which underlines the lack of central educational management.

In response to the 2nd question about whether communication networks are established among members of the educational community and what kind of networks they are, we found out that a significant number of users have access to courses offered in e-learning systems. Between 2007 and 2010 there has been a significant increase of registered users from 31,924 (the recording is done only on eclass platforms) to 83,496 users, in other words the number has more than doubled. The access to the offered courses seems to encourage students to establish closer contact with their teacher. The wider use of Information and Communication Technologies (ICT) is considered to be important, since it could provide educational material. In addition, it is advisable to use all the educational opportunities provided by the platforms and not just simply ‘reproduce’ the conventional course as supporting material available on the Internet.

In addition, many courses are closed courses, an element that 'isolates' institutions. In 2007, out of 3100 recorded courses, 43% were open courses (1346 undergraduate and postgraduate courses), whereas in 2010 out of 5022 taught modules (there was a significant increase by 38%, in taught modules provided within 4 years), open courses are approximately 55% (a small increase). The postgraduate courses in 2007 constituted the 6.74% of the offered courses (209), whereas in 2010, there was a significant reduction and they constituted only 3% (146). In the relation of open-closed courses in undergraduate courses in 2007, which constituted 93% of the offered courses, the percentage of open courses is 45%, whereas in 2010, forming 97% of all subjects (reduction of postgraduate courses despite the growth of graduate programs in TEI) there are 55% open and 45% closed courses. In postgraduate courses in 2007, only 15.7% were open, while in 2010 there is a small increase and the respective figure is 20.5%. These data suggest that the ability of users to access learning materials, especially at postgraduate level is significantly restricted. Moreover, the drop of the postgraduate courses offered on the through e-learning platforms is mainly because either the courses are offered to universities affiliated with TEI to provide postgraduate programs in their respective platforms or they are provided to independent websites.

Another serious problem is the lack of availability of courses in foreign languages, which does not give any opportunity to attract international students.

In response to the 3rd question about the use of e-learning systems in the laboratory courses, since these Institutions are technological, several laboratory courses were offered either as core modules or optional ones within a laboratory or a theoretical module. However, it should be underlined that in 2007 there were only 19 virtual laboratories that were available online or real time, whereas in 2010 there was a reduction, there were only 6 in all participating TEIs. This may be due to lack of infrastructure in broadband networks, data transmission quality, communications security, lack of appropriate equipment for the implementation of laboratory exercises, lack of expertise and skills when applying ICT in educational practice and the lack of skilled support staff.

In response to the 4th question, about whether there is any particular preference to a specific e-learning system and if so, what the possible reasons for choosing it are, the survey revealed the widespread use of the eclass platform and the Claroline platform in general, on which it is based. This is because the eclass platform offers many possibilities that a teacher needs in order to offer a course on the internet and also it belongs to the category of open software, so it does not burden the budget of the institutions.

The academic network GUNet (Greek Universities Network) provides support for the implementation of the eclass platform in any institution, which facilitates its installation and operation. In addition, the eclass platform provides an internal structure for each lesson, which promotes communication between learners and educators, learning with active participation and ensures open and free access to educational material. In general, in 2007 and 2010 there was frequent use of eclass platform and
the parent platform Claroline (by 87.5%) in TEI and ASPAITE, which conducts them dominant in the e-learning systems in the Greek Higher Technological Education. Furthermore, in 2010 there was a transition to the new version of the eclass 2.xx to 5 institutions out of the 14 using the platform. The second most widely used platform is Moodle, followed by classweb v1.0, the Lotus LVC 1.1, and the blackboard.

In response to the 5th question about whether there is a single strategy in the use of e-learning systems in the institutions, we assume that several TEIs (TEI of Athens, Piraeus, Thessaloniki, Western Macedonia) in 2007 & 2010 use many different platforms, where the learning material is recycled and lacks a single policy and strategy for their use. Therefore, in the same department there are several platforms, which instead of helping the student and the teacher confuse them. The teacher should, in most cases, select or update simultaneously 2 or even more platforms, which means a significant loss of valuable time.

In response to the 6th question about whether there is use of Internet software to support the educational process based on the results of this research (2007-2010), it is clear that it is used by all institutions. Departments, laboratories and teachers’ sites provide learning material (texts, educational software). Moreover, the last two years, cutting-edge network services to the Educational and Research Community are offered through the National Research Network (GRNET), which connects all universities, TEI and Research centres in the country with high speed Internet access, consistently serving approximately 500,000 users throughout the country. In particular, the following services are offered:

- Pithos (http://pithos.grnet.gr) - offers 50 GBytes network storage area to each user in the participating institutions, accessible from anywhere, always in safety. The service offers potential for versioning, backup archiving and easy sharing of files with other users.
- Anafandon (http://anafandon.grnet.gr) - facilitates the electronic acquisition and installation of commercial software and services, at no cost.
- Diodos (http://diodos.edu.gr) - residential broadband connections, for permanent and fast Internet connection, on favourable terms and at the lowest possible cost. Moreover, via diodos service, users obtain an academic IP and direct access to many online applications, such as the library of scientific articles www.heal-link.gr.

In response to the 7th question about whether institutions use modern training rooms, according to the findings of this survey some video conferencing sessions are carried out, which are mainly individual courses, seminars, workshops and conferences. The technical infrastructure seems in many cases that cannot support large-scale use of such systems.

IV. DISCUSSION-CONCLUSIONS

Nowadays, it is important to have sufficiently studied the efforts made for the introduction of e-learning systems and explore the experiences of teachers, who used them and finally evaluate their results ([10], [11]). In this context, the current research can also contribute, in providing data and stimulating fruitful discussion trying to develop such standards. Due to the technological developments of recent years two-way communication between remote audiences is now possible and relatively easy. Consequently, the organization of integrated courses at undergraduate and postgraduate level has been made possible.

By completing our research and conducting quantitative and qualitative analysis of the results using the 7 levels of the Research Systems Framework (RSF) we created for the study of e-learning systems in Higher Technological Education, it is interesting to state some important general findings. It should be noted that in theory the possibilities (technical and educational) that e-learning systems provide, are being used by teachers, without, however, this leading to a substantial change in the way of course organization.

In general, the use of ICT is considered to be relatively poor, which is likely due to lack of funds, expertise and skills on behalf of teachers and learners, as well as the lack of national infrastructure regarding networks and corresponding resources. Although, the last 2 years new services have been offered to the institutions, yet they have not been fully assimilated by the entire educational community. It also appears that communication networks among members of the educational community are established, but there are barriers to free access to the general public and there is no opening to the international audience, because there is “introspection” ("us for our students") in the offered courses. Despite the technological nature of the institutions there is little use of virtual laboratories. Modern training rooms are used in individual courses, seminars, workshops and conferences. In several of the TEIs, which participated in this study, a significant number of platforms is used, whose educational material is recycled. Moreover, it is evident that a coherent policy and strategy regarding the use of educational platforms is missing, even though a large number of institutions use web software to provide educational materials.

The online platforms combine features of synchronous and asynchronous learning, offering this way significant potential in teaching courses. However, they require a change of the way of lesson planning and integrating ICT in the organization and presentation, but also in the educational practice. One of the findings of this study pinpoints that TEI and ASPAITE use such systems significantly, which mainly operate in support to the conventional way of teaching, without still achieving a meaningful change in the way of lesson planning of the courses offered.

REFERENCES


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