Asynchronous learning service evaluation: a case study at TEI of Crete

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Abstract

Nowadays, with the development of ICT (Information and Communication Technology) and the rapid growth of e-learning, educational procedures in tertiary institutions change in a considerable manner. The implementation of virtual learning environments depends on decisions related to the educational design and on other decisions related to technology itself and the selection of the most appropriate system and tools. During the last four years (2004-2008), TEI (Technological Educational Institute) of Crete is using an asynchronous e-learning platform, called *e-class*, to enhance traditional classroom instruction by incorporating a number of activities through the network. In this study we are trying to analyze the use of this asynchronous tele-education platform and we present our experience from the teachers' and students' perspectives for the use of this platform. We argue that *e-class* is used at TEI of Crete as an innovative tool and platform's users consider that they are more active and productive in the asynchronous e-teaching environment, although they have not fully exploited it yet. The lecturer role changes in this new environment from a centered knowledge disseminator to learning guider. Because of this we are in an opinion that this fact is very crucial in a Learning Management System (LMS) like *e-class* were the learners depend more on content than on the lecturer.

Keywords

Asynchronous Education, E-class, TEI of Crete, Evaluation

Introduction

The sector of tertiary education in Greece is currently facing new challenges and incentives. On an international level, the Bologna Declaration forces the institutions to implement a consecutive study model with the internationally accepted bachelor and master degrees. Due to the ongoing standardization, study programs are becoming more comparable and provide a greater international compatibility. As a result, the competition on a national and international level will rise; continuity and homogeneity are no longer guidelines for the modern academia. To take advantage of the current situation, it is of vital importance for tertiary educational institutions to seek new ways to assert their position and strengthen their profile. Technology can make lifelong learning a reality (Reagan, 1998) and many academics understand the idea that technology and society are intimately and dynamically connected, each shaping the other. Education and society are also intimately and dynamically connected, each leading the other. Technology shapes much education but education has little control over technology. Thus, the integration of e-learning is becoming a strategic, yet challenging goal, making it crucial for universities to highlight their e-learning activities and to present a modern profile to the public (Kalogiannakis, 2004).

The implementation of e-learning has to be accompanied by a fundamental organizational change within the academic institution. Integrating e-learning has an impact on diverse activities like library management, assessment and administration, research, publishing and the cooperation between institutions (Guri-Rosenblit, 2005). Distributed education via the Internet is a growing practice in many institutions today, some of which offer not only individual courses, but entire programs of study. Over 50% of larger institutions (those with over 7,500 students) offer at least one entire degree program online (Allen & Seaman 2006). These authors also report on the growth in the use of online learning, citing an unexpectedly high 39% increase in 1 year (2003/04 to 2004/05).

In the framework of this research we are trying to analyze the use of asynchronous education platform at TEI of Crete. This platform, named as "*e-class*", originally developed at the Université Catholique de Louvain (Belgium) is a typical asynchronous tele-teaching platform which supports synchronous ways of communication and interactivity, which is the condition of communication for the users (Rafaeli & Sudweeks, 1998). This particular platform gives to the lecturer the ability to organize his educational material and present it in various media through the network.

Theoretical framework

Nowadays with the Internet progresses a wider variety of on-line and off-line educational opportunities emerge and the main roles of the institutions of tertiary education can be easily reproduced online. Technology integration should be associated with constructivist teaching practices (Driscoll, 2000; Putnam & Borko, 2000). Within a constructivist framework, technology is used and integrated not to support largely teacher-led, lecture dominated activities but student-centered activities where students play an active role in their own learning process. Within the new virtual environment provided by e-learning the possibilities, accessibility and other options previously not possible in the traditional classroom now become available. With the advancement of the ICT the new e-learning environment is thought to offer more possibilities and options in comparison to the traditional classroom especially in filling the gap previously left in the traditional classroom (Kalogiannakis, 2004).

E-learning is conventionally regarded as more self-directed and teacher independent than traditional teaching, but in fact the teacher is eventually responsible to provide the elements of learning in all teaching situations. Thus, the personal potential of the teacher has to be regarded as one key element to success also in online instruction. The technical aspects of e-learning have been studied widely (Berge, 1998; Schifter, 2000) and because of the technical development, current e-learning environments are more reliable and more usable than before. Therefore, the research in the future should be more human-centered than technology-centered. Moreover, it should be noted that in earlier e-learning studies learners' behavior has been studied more widely than teachers' behavior. From this basis, the teacher's point of view on e-learning as well as the external factors affecting teachers' opinions and mental resources are important issues to study. The implementation of virtual learning environments depends on decisions related to the educational design and on other decisions related to technology itself and the selection of the most appropriate system and tools. This selection requires thinking about instructional design principles, knowledge of the existing technology and their educational possibilities. Sometimes when an institution plans to implement a virtual learning environment, the person who makes the decisions, does not have knowledge of both the pedagogical and technical areas. Usually the selection of a Learning Management System (LMS) is based principally upon technical criteria. One of the challenges for practitioners in institutions of tertiary education is to develop pedagogies that enhance the possibility and effectiveness of anywhere, anytime learning.

Valentine (2002) indicates that the misuse of technology could be a problem for the instructor in a networked learning environment, although this problem may arise from lack of training, instructor's attitudes, or hardware problems. Faculty should learn how to use technology, but not completely rely on the technologies. Instead, teachers should be able to identify and recognize the strengths and weaknesses of technologies, and, select the most appropriate delivery mechanism for their lessons (O'Quinn & Corry, 2002). Some of the challenges and barriers for e-learning are the change of roles and responsibilities for instructors (Zheng & Smaldino, 2003) and use of technology (Valentine, 2002; Berge, 1998). Learning tasks should, as far as possible, be embedded in the target context and require the kind of thinking that could be achieved in real life (Lave & Wenger, 1991). Derry and Lajoie (1993) have argued the appropriate role for a computer system is not that of a teacher/expert, but rather, that of a mind-extension cognitive tool.

The pedagogical benefits of collaborative learning in a networked learning environment like *e-class* are multiple and varied. Through this technique students can be stimulated to negotiate information such as abstract, ill-defined and not easily accessible knowledge and open-ended problems. Also, collaboration enables the discussion of complex problems from different perspectives and supports learners in the elaboration, explanation and evaluation of information in order to re- and co-construct new knowledge or to solve problems (Veerman & Diermanse, 2001). For Georgouli at al. (2007) LMS like *e-class* are likely

to occupy an ever increasing and prominent role in the teaching and learning process, paving a new road changing the existing ways of teaching and learning, from a traditional in class way to totally synchronous or asynchronous distant one. One important reason to choose *e-class* at TEI of Crete was that it is open source. *E-class* can be modified to fit the special needs of an educational environment, offering the programmers the possibility to develop additional functionality at their own pace without begging a proprietary vendor to include a feature. Although the transition from traditional lecture style to a more technology-based format should not be difficult, because instructors already possess relevant course material, most instructors are using *e-class* just as a content repository (Georgouli at al., 2007).

Methodological Approach

During the last four years, TEI of Crete is using an asynchronous e-learning platform, called "*e-class*", to enhance traditional classroom instruction by incorporating a number of online activities. In this article, we present our experience from the use *e-class* which is an asynchronous e-learning platform developed by the Greek University Network (GUNet), based on an Open Source software named Claroline. This particular platform consists of a multilevel organization structure and gives to the students the opportunity to organize their study using the educational material published through the network. Additionally they have the ability to interact synchronous (chatting) or asynchronous (e-mail/forums) with the tutor and other colleagues providing a collaborative learning environment allowing instructors at TEI of Crete to create and administer courses through the web. The platform has a pedagogical effectiveness related to the objectives of the course, offering easy and friendly navigation and use of its functions for both educators and learners (Georgouli et al., 2005).

The current study is an expansion of our earlier work presented by the authors during the period of introducing *e-class* platform at TEI of Crete. More specifically, in 2004-05 our work was based on a survey which was constructed and designed by means of semi-directed interviews with students and teachers users of the platform and two types of questionnaires (for students and for instructors). Obviously, this sample was not representative of all teachers at TEI of Crete as the service was fairly new at TEI of Crete. The structure of the interviews covered the following 3 main categories:
(a) exploitation issues of the e-learning platform,
(b) assessment of the e-learning platform services and
(c) prospects and proposals.
In this article we try to evaluate the current use of the asynchronous e-teaching service, in comparison with the previous situation of the academic period 2004-05.

Our method is a quantitative analysis measuring platform's utilization and evaluating the service progress by enumerating the user's exploitation of various systems' features. We choose to analyze the following features:

- Agenda (feature to inform about course evolution & calendar).
- Content (capability to publish electronic educational material).
- Discussions (forum function concerning the course).
- Links (advising for additional material through internet).
- Announcements system.
- Course description.

We gather information concerning the measurable usage of the above features, for the academic year 2007-08 and we try to assess them. One other topic that interests us is the number of client hits per month. That is the number of students who visit the courses in the platform every month.

We deliberately do not include courses of the School of Applied Technologies of TEI of Crete. That's because we assume professors in this specific school are more familiar with ICT applications and this fact could affect positively the results. Besides, our main purpose was to study the influence of asynchronous e-learning environments in not ICT-related departments of TEI of Crete. Another aim is to compare our conclusions with the results of our previous studies (Kalogiannakis et al., 2005(a), Kalogiannakis et al., 2005(b), Liodakis et al., 2005, Vassilakis & Kalogiannakis, 2006, Vassilakis & Kalogiannakis, 2007).

Results

The survey applied on courses of ten departments of TEI of Crete. Three of these departments are concerning branches of TEI of Crete, which are located in cities of Crete away from institute's headquarters (Heraklion). The platform's site is http://eclass.teicrete.gr and as it is noted (Georgouli et al., 2007) for a course being delivered for years in a traditional way in the classroom, the transformation to an e-learning enhanced one needs a set of decisions and actions to be taken The introduction of blended learning in a course may be viewed as a strategic educational development project and we need to study in depth the tools existing in the department's LMS and to see how these could be used to support the currently used educational methodology and the learning objectives (Georgouli et al., 2007).

Eventually, information for 228 electronic courses was retrieved. Not all of these electronic courses are active though for the current academic year. Totally 174 active courses were examined concerning the ten departments. The results of the survey for all the departments of TEI of Crete are summarized in Table-1.

Table-1: Platform usage for 10 departments, 174 courses

Courses using	All departments of TEI of Crete	Percentage
Agenda	31	17,8 %
Content	162	93,1 %
Discussions	17	9,8 %
Links	44	25,3 %
Announcements	105	60,3 %
Course description	83	47,7 %

For the three departments at branches of TEI of Crete, the corresponding usage is summarized in Table-2. Totally 93 courses created at the branches of TEI of Crete in different cities.

Table-2: Platform usage for 3 remote departments, 93 courses

Courses using	Remote departments (branches) of TEI of Crete	Percentage
Agenda	8	8,5 %
Content	91	96,8 %
Discussions	10	10,6 %
Links	17	18,1 %
Announcements	58	61,7 %
Course description	37	39,4 %

Table-3 describes the total traffic (hits per month) for the *e-class* platform. This shows how often students visit the platform and use the service. The following data concern October and November 2007.

Table-3: Traffic of the platform for the months October-November 2007

Hits per Month	All departments of TEI of Crete	Remote departments (branches) of TEI of Crete
October 2007	13141	7791
November 2007	13426	6709

More specifically we observed that for the 174 courses we have 423 visits per day in October 2007 and 447 in November 2007. Concerning the 93 courses of the branches we have 251 visits per day in October 2007 and 224 in November 2007.

Discussion

Foregoing researches of *e-class* at TEI of Crete

In 2004-05, the first period of *e-class* use at TEI of Crete the frequency of platform use was not encouraging, maybe, because the exploitation of the platform was fairly new (Liodakis et al., 2005). After the content analysis of the interviews with teachers, one of the first conclusions of our previous researches was the overturning of the relation teacher-student. The role of the lecturers at the *e-class* platform seemed complicate and demanding. They often needed to spend most of their time and creativity to satisfy the new requirements and there was a satisfactory communication level between student-tutor. The educational process was transferred at the student's space, without the presence of the tutor. In such environments, according to our sample the lecturer acted rather as consultant, in addition to his traditional duties. Teachers argued that they are more stimulated when they have to prepare a course through the *e-class* platform although they did not fully exploit it. Teachers of our research did not feel that they were loosing control over the learning process in the ODL (Open and Distant Learning) environment. They cooperated with their students in the asynchronous education platform but they did not perceive it as a replacement of the instructor.

Distant learning environments for the teachers of our study at TEI of Crete offered the ability to show their work to a wide audience. For them, in a way, publishing online was an extra motivating factor. Additionally, it was an easy way to have huge impact and large audience (Vassilakis & Kalogiannakis, 2006). Teachers at TEI of Crete users of *e-class* argued that online courses that integrate learning engagement with resources and social interactions were therefore much more likely to enhance learning. Other main findings of our previous studies included the necessity of establishing an appropriate pedagogical framework, related to a well organized presentation of the educational material, the definition of teaching goals, and the use of teaching methods adapted to the needs and knowledge level of students. In addition, it was emphasized by teachers-users of *e-class* at TEI of Crete that there was a great need for institutional support, in terms of policies and availability of the technological infrastructure. Analysis of instructors' responses about the assessment of the e-learning platform services showed that the format and organization provided by the LMS was fairly good and that access to the services was easy.

Advantages and major issues for further exploitation of *e-class*, as mentioned by the instructors, included the immediate, easy and in a cost effective manner availability of lecture notes and transparencies and the environment and facilities provided by the LMS are considered to be fairly good for the development of an electronic course. Some disadvantages mentioned by the teachers users of *e-class* concerned the additional time needed for the organization of a course and for the preparation of the educational material in an appropriate format, is considered as a disadvantage and the need for the availability of an Internet connection for full exploitation of our platform's services, as experienced by complaints of the students (Kalogiannakis et al., 2005(b)).

Analysis of students' feedback regarding the exploitation issues of the e-learning platform revealed that most of students used it on a rare basis. They believed that it can be used either on a supplementary basis or as the primary educational material. Students believed that instructors were more active in this asynchronous learning environment. From students' responses, we concluded that this LMS helped them for the organization of their study although they were not satisfied by its features for students' evaluation. Student-users argued that they are more stimulated when they have to attend a course through this platform may be due to the fact that ICT always attract young population (Turkle, 1997, Castells, 2002). They also believed that the instructor was more active in an asynchronous learning environment (Kalogiannakis et al., 2005(a)). Analysis of students' responses showed a general agreement of students and their satisfaction for the services provided by *e-class*. As it concerns the organization of *e-class*, in particular, most of them assessed it as fairly good. In addition, they regarded that the access to the platform's services was easy (both for registration and during services' use).

Focusing on the advantages and disadvantages of the *e-class* identified by the students, a variety of beliefs was expressed. In particular, *e-class*' advantages reported, included: the efficiency of learning irrespective of time and space constraints, the easiness and modularity experienced during navigation of the electronic courseware, saving of students' time, the richness of the educational content, the availability of student-instructor interaction on a non-scheduled time basis, etc. (Kalogiannakis et al., 2005(a), Vassilakis &

Kalogiannakis, 2006). Students became more independent and more actively involved. As it concerns the platform's disadvantages from the student point of view, these were related to their conception about the whole educational system and processes provided by tertiary institutions in Greece and the unavailability of a more personalized view and use of the LMS (Vassilakis & Kalogiannakis, 2006). Finally, the main issue for further platform exploitation according to students was the need to promote the availability and operational advantages of the platform to the academic staff of TEI of Crete. The dominant proposal for the improvement of *e-class* according to students was to complement its services with synchronous tele-education provision (Vassilakis & Kalogiannakis, 2006).

Both teachers and students regarded the platform's services as a support and complementary tool for the conventional way of education. Some negative implications of distant learning were mentioned by both teachers and students of *e-class* arguing that was not very widely spread and known at TEI of Crete and the possible loss of social contact and isolation of a distant learning student. In our previous researches we found out that access to distant resources was rapidly becoming commonplace but the understanding of how to make good use of these resources, was only slowly emerging (Kalogiannakis et al., 2005(a), Vassilakis & Kalogiannakis, 2007).

Current situation of *e-class* platform at TEI of Crete

There is a substantial increase of platform use comparing the present state with the status during the academic period 2004-05, where 42 courses were developed (September 2005) for the same departments. During the academic period 2006-07, totally 228 courses were developed (November 2007). In two years the number of active courses and the visits show that the platform is a considerable tool of the educational process of TEI of Crete.

From the results shown in Table-1, we observe that 90% of the courses the tutors use content features, but only 10% use discussion feature. We concluded that most of the educational process is content-oriented and that there is a low rate of interaction between the participants of the course**.** The latter despite the fact that computer facility and the network infrastructures in the campus are in satisfactory level. This means that tutors actually have not change their teaching culture, even though they use a lot ICT and they create a lot of asynchronous course sites in the *e-class* platform. More specifically looking in the content types, most of them concern tutors notes and there is a lack of exercises and assignments, notifying that very few tutors use platform's evaluation facilities. Also there are 54 not active e-courses. Apparently, tutors attempt to create e-courses, but they do not continue to operate them. Various reasons could cause the above attitude like, teacher's resistance on new educational process and tools, tutor's familiarization with ITC, additional time needed to prepare the course, lack of training, immature institution policy etc. These conclusions are in accordance with our previous studies (Vassilakis & Kalogiannakis, 2006, Vassilakis & Kalogiannakis, 2007).

Concerning the traffic of the platform the results in Table-3 show that students visit the electronic courses quite often. It seems that new educational approaches always attract young people. Students show more familiarity with ITC and maturity to use emerged services in a networked learning environment. There is a significant difference between the courses of the remote departments and the courses of the departments in headquarters of TEI of Crete (Table-2). The departments of the branches of TEI of Crete offer 93 of the 174 courses and receive almost half of the total student visits. One explanation of this is that some teachers of the courses at the remote departments do not live in the cities, where the branches of TEI of Crete are established. Consequently, they use much more the facilities of the platform.

Based on the above theoretical framework and the results of our previous researches (Kalogiannakis et al., 2005(a), Kalogiannakis et al., 2005(b), Liodakis et al., 2005, Vassilakis & Kalogiannakis, 2006, Vassilakis & Kalogiannakis, 2007) we argue that *e-class* platform is used at TEI of Crete as an innovative tool. Platform's users consider that they are more active and productive in the asynchronous e-teaching environment, although they have not fully exploited it yet (Kalogiannakis, et al., 2005(a), Vassilakis & Kalogiannakis, 2006).

Finally, we should consider another important issue. Moving from traditional classroom into e-learning environment teaching and learning should adapt to the new circumstances and possibilities. If the

teacher/instructor/lecturer is not aware of the learning theories and what makes good teaching principle the movement into e-learning environment where students depend on good content and interactivity much more this might be a serious issue. In terms of pedagogy, practice and theory in networked learning is still at a relatively early stage; however, emergent trends and models point to the influence of educational theories that conceptualize learning as an active, situated and fundamentally social practice.

Conclusions and Implications

Although, nobody questions the introduction and the advantages of ICT in education, it seems that teachers still worry as far as the limited use of e-learning is concerned. At TEI of Crete the main use of *e-class* platform remains the educational content management. What will be the impact of ICT opportunities and distance education at TEI of Crete in the future is a very important issue. We should anticipate and foresee this impact in order to avoid the undesired and possible devaluation of contemporary education, long life learning and knowledge construction. Is it possible to reduplicate tertiary education roles in such a level that everything could be realized online?

Still some lecturers see e-learning as access to information and not as a process of distributed engagement and learning (Henning, 2003). From the outcomes of our previews studies, we consider that some teachers at TEI of Crete have started to change their pedagogy based on a flexible and evolving epistemology. For these educators, an online teacher has to further encourage and support the student during the distant educational process.

We argue that *e-class* platform could help our institution for a successful transition from a traditional to a blended way of learning and teaching. The challenge is to persuade academics at TEI of Crete that such e-learning systems could offer qualitative content and benefit for themselves, students and faculties. After almost 4 years of experience using the platform (2004-08) it will be crucial to invest in training seminars and innovative programs for the teachers of all the departments of TEI Crete. We plan in the near future through scheduled seminars to train teachers of TEI of Crete on platform's features exploitation. On the other hand, teachers with experience in ICT applications on teaching should increase the level of adoption of the platform. Instructors must redesign their courses, so that e-learning effectively incorporates into the pedagogy which takes commitment and time.

The impact of e-learning on institutions of tertiary education will globalize education in a world wide framework and will increase the level of knowledge dramatically. The level of information and knowledge dissemination will also increase rapidly in such a level that it will become very hard to grasp its borders. Instructors must be trained not only to use technology, but also to shift the way in which they organize and deliver material. We argue that further research is required in order to understand the roles and the demands of teachers and to find out the conditions in which students are less dependent on teachers. In parallel, with use of ODL environments as LMS we ought to study more deeply the complex pedagogical issues involved in the uses of ICT. We anticipate that the next step for the modern institutions of tertiary education will be to turn to distance education and e-learning in general and we ought to study more deeply the complex pedagogical issues involved in distant learning.

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