

USING ASYNCHRONOUS E-LEARNING AS A SUPPLEMENT TO TRADITIONAL LABORATORY COURSES IN GRAPHIC ARTS

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Abstract

This paper reports on a study concerning the use of a Learning Management System (LMS) to supplement a laboratory course in Graphic Arts. The study was conducted mainly in order to explore students' readiness and attitudes towards using a web-based course as a supplement to their normal one and to examine whether characteristics such as gender, educational background, and ICT literacy level have any impact on these attitudes.

Introduction

E-learning is one of the revolutions that were born through the growth of the Information and Communication Technologies (ICTs) and changed everyone's point of view about education and the delivery of knowledge (Tavangarian, Leypold, Nölting, Röser, & Voight, 2004).

In the last few years, learning through the Web has become a quite common and rather popular way of providing instruction, especially in higher education and vocational training. Most institutions in order to implement web-based learning rely on Learning Management Systems (LMSs). These are platforms that enable the creation of virtual learning environments that can be used either as a supplement to traditional face-to-face instruction or even as fully online courses for virtual universities. While the precise specifications vary from an LMS to another, these systems typically provide tools that allow class and user management,

content development and delivery, asynchronous and synchronous communication and learner assessment (Coates, James, & Baldwin, 2005).

This paper reports on a study concerning the use of an LMS to supplement the laboratory course “Offset Printing Techniques II” taught in the 5th semester at the Department of Graphic Arts Technology of the Technological Educational Institution of Athens. The mixed delivery approach that was adopted for this course — using web-based learning to augment rather than replace traditional instruction — combines the advantages of online learning with the benefits of face-to-face interaction (Woods, Baker, & Hopper, 2004). Previous research has shown that the mixed approach may improve student morale and overall satisfaction of the learning experience (Byers, 2001) and enhance information skills acquisition and student achievement (Kendall, 2001; Novitzki, 2000).

In light of these findings, the e-course that is discussed in this paper was developed with the main aims to: (a) familiarise learners with working via the Internet, (b) enhance their collaboration spirit and skills and (c) direct and support learners in developing and using an appropriate methodology for collecting valid information from digital libraries and other sources on the web.

An empirical study was conducted in order to evaluate this supplementary e-course. In particular, the focus of the study was to explore students’ attitudes towards their e-learning experience and to examine if these attitudes are being affected by various characteristics such as gender, age, educational background, and ICT literacy level.

The Laboratory Course “Offset Printing Techniques”

“Offset Printing Techniques II” is a laboratorial course that is taught to the students of the Graphic Arts Technology department of the Technological Educational Institution of Athens in the 5th semester of their studies. It takes place in the printing laboratory which consists of two rooms. In the main room, three Offset printing machines with conventional dampening systems and three letterpress printing machines are settled down. In the auxiliary room, an Offset printing plate processor system exists.

For the conduction of the lesson the students are separated in teams of about 8–10 students per tutor. The main topics of the course include the students' training in the manufacturing of printing plates, the regulation of the printing machine, the transaction of colour printings, quality control of the produced printed matter with the use of specialized equipment (spectrophotometers and densitometers), the determination of work flow for the conduction of printing and also the maintenance of the machine.

To support their learning, students are provided with course notes, a list of relevant websites and some readings for further study. Students are required to develop and submit 8 assignments either in printed or electronic form.

Some problems that were observed while teaching the course in the traditional way were the following: (a) students were facing difficulties using the Internet, (b) most students were neither willing nor capable of working cooperatively in group projects, and (c) students seemed not to be using any specific methodology in order to find information useful for their assignments on the Internet. It should be noted that these problems are not related to the particular course; they rather reflect the students' weakness to work in a more "professional" way.

The E-Course "Offset Printing Techniques"

Using a web-based course as a supplement to the normal laboratory lessons was thought to be a possible way to overcome the above mentioned problems — or at least, help in that direction. In particular, this effort aimed at familiarising students with working via the Internet, enhancing their collaboration spirit and skills by engaging them in online discussions through bulletin boards, chat rooms and forums, and providing them direction and support in developing and using an appropriate methodology for finding valid information from various online sources.

The web course was built with E-Class, an asynchronous e-learning platform provided by GUNET (Greek Universities Network). The developed course consisted mainly of lecture notes and other useful documents, a list of assignments with closed dates of submission and also

self-assessment exercises with automatic marking and feedback. Furthermore, various communication tools such as chartrooms, forums and bulletin boards were also included.

The Study

At the end of the semester, a study was conducted in order to reveal possible problems that students were facing with this particular course, to explore students' attitudes and readiness to use an LMS as a supplement to their normal laboratory lessons, and to examine whether their attitudes are being affected by various characteristics such as gender, age, educational background, and ICT literacy level. It should be noted that the aim of the study was to explore students' attitude towards the supplementary e-course as well as the factors that influence that attitude; the study did not deal with students' learning performance, since this is the outcome of both the traditional and the web-based course.

Most of the data that were examined came from a questionnaire that the participants in the study were requested to answer. The questionnaire consisted of four parts. In the first part, students were requested to provide personal information concerning their age, gender, type of high school from which they graduated and the educational level of their parents. The questions of the second part concerned the accessibility in new technologies and also the ICT literacy level of the students. In the third part, students were asked to state the degree of satisfaction they felt, as well as their future expectations concerning the application of this mixed delivery approach that was adopted for the course. In the last part of the questionnaire, students were requested to judge the usefulness of the tools/components that were embedded in the e-course and express their opinion and comments about this experience.

Twenty-nine students participated in the study (out of 46 that were enrolled in the course) —13 males and 16 females. With regard to their educational background, 21 have graduated from general high schools and 8 from vocational/technical ones.

Students' answers to the second and third part of the questionnaire were used to form four groups of answers corresponding to four factors that would be the focus of the study. For each group, students' answers were

fit in a 5-grade scale and they formed the following four factors:

- computer and Internet accessibility (Accessibility factor: AF);
- ICT literacy level (ICT literacy factor: LF);
- the satisfaction students felt by the incorporation of the e-course in their normal laboratorial course (Satisfaction Factor: SF); and
- students' future expectations concerning the incorporation of such e-courses in the laboratorial courses (Expectation factor: EF).

These four factors were studied as for the gender and as for the students' educational past (type of high school of graduation).

Results of the Study

The mean values of the above mentioned factors in correlation to the students' gender are presented in Table 1.

Table 1: The accessibility, ICT literacy, satisfaction and expectation factors in correlation to gender

0≤xF≤5	Accessibility factor (AF)	ICT literacy factor (LF)	Satisfaction factor (SF)	Expectation factor (EF)
Male	4.15	3.32	4.15	4.58
Female	4.31	2.94	3.09	3.89
Total	4.24	3.11	3.63	3.93

As appears in Table 1, the accessibility of students to a Personal Computer and the Internet is considerably high for both genders, with women presenting a slightly higher AF. On the other hand, the ICT literacy, satisfaction and expectation factors hold higher values for men than for women. This leads to the conclusion that men feel more comfortable with the new technologies and have a considerably stronger self efficacy feeling (though this may not always correspond to their real potential). Men seem to be very satisfied (4.15) with the integration of e-class platform in the course and their future expectations are very high (4.58). Women seem to be less satisfied (3.09) with the platform but their

expectations — even if lower than those of men — are still quite high (3.89).

According to the information that the participants provided concerning the usefulness of the tools/components of the e-course, the following points are worth mentioning: Men considered more useful those tools that were directly related to their obligations for the course, while women considered equally useful some informative elements (e.g., description of the course). Furthermore, men did not find the self-assessment exercises to be useful, while for women these were considered as an important tool of the course.

The four factors' values in correlation to the students' educational background are presented in Table 2.

Table 2: The accessibility, ICT literacy, satisfaction and expectation factors in correlation to educational background of students

0≤x≤5	Accessibility factor (AF)	ICT literacy factor (LF)	Satisfaction factor (SF)	Expectation factor (EF)
General High school	4.71	3.28	4.52	3.97
Vocational/technical High school	2.71	2.60	1.07	3.33
Total	4.21	3.11	3.66	3.82

As appears in Table 2, the accessibility of students to a Personal Computer and the Internet is considerably higher for the general high school graduates (4.71) than for those who graduated from vocational/technical high schools (2.71). This is also the case for the ICT literacy level (3.28 vs. 2.60). Probably due to these facts, a great dissatisfaction (1.07) is observed to the vocational high school graduates against the integration of new technologies in the laboratorial courses. Surprisingly, positive in this case is the fact that these students have high future expectations (3.33) from the application of new technologies in their courses.

Concerning the tools that were considered useful, only 1 of the 7 graduates of vocational high schools answered “the documents for further study” and another one “the self-assessment exercises”. Compared to the

answers of the general high school graduates this finding leads to the assumption that the vocational high school graduates are much less seriously concerned about their courses and they seem quite unwilling to study in depth for those.

Conclusions

This paper reported on an empirical study that was conducted in order to evaluate an e-course developed and used to supplement a traditional laboratorial course in the field of Graphic Arts.

Certain differentiations were noticed as for the gender of the students. While new technologies are highly accessible by both genders, women seem to be less familiar with their use and they also have lower expectations from them than men. As a consequence, women's satisfaction from the e-learning application that supplemented the laboratorial course was rather low.

Some important conclusions were drawn as for the educational background of students: The vocational high school graduates have lower accessibility to technology, as well as a lower ICT literacy level. These were probably the reasons for being dissatisfied from the use of new technologies in laboratorial courses. Positive in this case is that their expectations from the new technologies are quite high, although smaller than those of the general high school graduates.

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