LESSON LEARNED FROM DESIGN, DEVELOPMENT AND LARGE SCALE IMPLEMENTATION OF EDUCATION TEACHER TRAINING OF AN OPEN SOURCE LMS, USING THIS LMS

I. Papantoni[1], C. Pierrakeas[1], K. Dragogiannis[2]

[1]T.E.I. of Western Greece, Department of Business Administration (GREECE)
[2]University of Patras, Department of Mathematics (GREECE)

Abstract

Although teachers and especially those of Primary and Secondary Education are positively predisposed towards new technologies, it seems that they do not embody them in educational procedure. Thus, in the last few years, the efforts to train teachers so that ICT's are exploited during their teaching practices have been intensified, given the fact that studies have shown that the continuous training of both Primary and Secondary Education teachers is of pivotal importance.

The primary purpose of the present study is the design, development and realization of a large scale training program in the framework of a specific open source Learning Management System (LMS) (Open eClass), for both Primary and Secondary Education teachers, using the same LMS, the use of which has adopted from the majority of Greek institutions of Higher Education. The design of program aims to demonstrate specific characteristics of the specific LMS, such as Ease of use, Ease of Learning, Satisfaction and Usefulness. For this reason, most of subsystems have been used and especially these that offer interaction between users, so that this system is not simply used as a repository of learning material. Of 155 teachers selected, 122 started the program and 79 completed it successfully. The high success rate indicates that one of the most crucial prerequisites for successful implementation of large scale training programs with LMS is the need for careful consideration of the underlying pedagogy and the emphasis on the interaction between users.

Keywords: Teacher training, long distance education, Learning Management System, Open eClass.

1 INTRODUCTION

The rapid development of technology and the diffusion of the Internet have changed the ways of teaching and learning ([1]). An innovative type of teaching was created, called e-learning, which can be defined as: "a technology for the development of learning experiences and environments which promote the acquisition of specific knowledge and skill by students" ([2]). Thus, in the last few years, the efforts to train teachers so that ICT's are exploited during their teaching practices have been intensified, although, it seems that they do not embody them in educational procedure.

E-learning can be implemented using Learning Management Systems (LMS). LMSs are software systems that synthesize the functionality of computer-mediated communications software (e-mail, bulletin boards, newsgroups etc.) and on-line methods of delivering course materials (e.g. the www) ([3]). The main tools that all LMSs provide are: i) asynchronous and synchronous communication, ii) content development and delivery and iii) formative and summative assessment ([4]).

Training programs / courses and especially the in-service training programs /courses contribute significantly to improve the whole education system ([5]). A trained teacher is more effective and thus able to plan better strategies to assist students in various aspects ([6]). Also, in-service training courses make teachers equipped with logical and systematic approaches to apply in classes ([7]). An in-service teacher training course: i) increases teachers' knowledge, ii) builds positive attitudes and beliefs, and iii) enhances the teaching practices ([8]).

2 AIM

The basic aim of the training program is to improve knowledge, skills and change the behavior of teachers in aspects of Information and Communication Technology. More specifically, this program is aimed at acquiring knowledge and skills in specific Learning Management System, so the participants are able to create and manage e-courses (e-class) and integrate them into everyday educational

practice. This formulation of goals is at three (3) levels, at the level of knowledge, skills and attitudes, as mentioned in the international practice of adult education ([9]).

This training program is implemented through the Open Eclass Learning Management System. In an effort to expand the usage of LMSs in higher education in Greece in a uniform way, the Greek University Network (GUNet) distributed the platform Open eClass ([10]), as shown in Fig. 1. In addition, it provided support for the implementation of Open eClass in any institution by facilitating its installation and operation. Open eClass was adopted by most of the Greek Universities and Technological Educational Institutions (TEIs) ([4]).

Figure 1. Screenshot of Open Eclass platform.

The research was designed, as shown in Fig. 2, to be implemented in five (5) stages: (i) literature review, (ii) curriculum design, (iii) development, (iv) implementation and (v) conclusions.

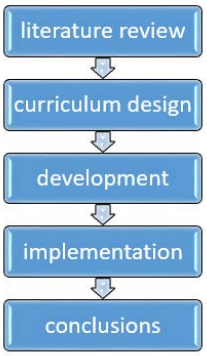

Figure 2 Stages of research.

3 DESIGN AND DEVELOPMENT

The Greek School Network – GSN ([11]) is the educational intranet of the Ministry of Education, Research and Religious Affairs. It interlinks all Greek schools and educational administration offices, and provides basic and advanced ICT services to students, teachers and administration personnel. It also contributes to the creation of new educational communities that use Informatics and Communication Technologies in the educational procedure ([12]).

The electronic classroom service (e-class) provided by GSN is available at http://eclass.sch.gr/. It is addressed to teachers and students of primary and secondary education and enriches the course that takes place daily in the classroom with modern educational ICT tools. The teacher can create online courses and fully interact with his/hers students. This service can also be used for training, collaboration etc. among teachers.

To develop the "Learning Management System: e-Class" training program, an electronic course (e-course) was created on the above-mentioned platform. This electronic course lesson is available at http://eclass.sch.gr/courses/9480072101/ and its homepage is shown in the following picture (Fig. 3).

Figure 3. Screenshot of e-course "Learning Management System: e-Class".

The e-course is the central core of the eClass platform. Each course is an autonomous entity in the platform, which integrates a series of modules. The e-course is, in fact, an articulate structure, which is organized and manipulated by the instructor in charge, based on the existing material and the eLearning model that will be followed

This e-course was set up as “closed” and consequently only user members in the course Users List have access to it and it isn’t available to the whole educational community.

An e-course has twenty four (24) available modules. For the purposes of the specific training program twenty-two (22) modules were enabled, and are the following: i) Documents, ii) Announcements, iii) Exercises, iv) Gradebook, v) Agenda, vi) Glossary, vii) Learning path, viii) Concept map, ix) Assignments, x) Questionnaire, xi) E-book, xii) Blog, xiii) Chat, xiv) Messages, xv) User Groups, xvi) Course Description, xvii) Multimedia, xviii) Progress, xix) Forum, xx) Links, xxi) Wiki, and xxii) Wall. The following modules were not enabled: i) Teleconference and ii) Attendance.

The communication of the trainees with the trainer can and should be done through the modules provided by the system. More specifically, the trainees could communicate with the trainer using the Messages, Forum, Chat, and Wall Tools modules. With the same tools, the trainees can communicate with each other.

In fact, with the Messages module, the trainer cannot control the messages exchanged by the trainees with each other, thereby providing private communication. The trainer, on the other hand, has the ability to communicate with the trainees in the aforementioned ways, but also through the Announcements and Teleconference, if enabled.

The duration of the proposal training course was five (5) weeks. Each week constitutes a course unit. Course units offer a way to organize educational material that is stored in the course learning modules in an articulate structure. More specifically, teachers can organize their courses’ structure based on the existing educational material in a way that follows the real life educational process. Course unit contents are accessible through the course homepage by clicking on the course unit title.

It is developed through distance learning principles through the course "Learning Management System: e-Class" (http://eclass.sch.gr/courses/9480072101/), which was created in the electronic classroom service (e-class) provided by GSN solely for that purpose

3.1 First course unit

The first week is titled "Introduction to Learning Management Systems" and consists of the following modules: i) Learning Management Systems, ii) Basic Characteristics of e-Class, iii) Personal Portfolio. and iv) Creating an e-course.

3.2 Second course unit

The second week is titled "Information, communication and collaboration tools" and consists of the following sub-sections: i) Announcements: Posting the course announcements, ii) Agenda: Chronological presentation of course events; iii) Messages: Exchange of messages between trainers and trainees, iv) Forum: Asynchronous exchange of ideas, v) Teleconference: Real-time

communication and collaboration, vi) User Groups: Grouping users to have a common discussion area and transloading area vii) Wiki: Collaborative writing, and viii) Chat: Communication with text messages, between trainers and learners, in real time.

3.3 Third course unit

The third week is entitled "Content Management" and consists of the following sub-sections: i) Documents: Organizing, saving and presenting learning content, ii) Multimedia: Storing and distributing audiovisual material, iii) Blog: Publish text posts in chronological order, iv) Glossary: Adding and managing key terms, v) E-book: Hanging, managing and presenting e-books in HTML format, vi) Wall: Reading multiple content posts (videos, documents, multimedia), vii) Links: Adding and organizing useful resources from the Internet, viii) Concept map: Creating charts that represent organized knowledge, ix) Course Description: Presentation of information on matter, objectives, educational activities, aids, ways of evaluating lesson, and x) Learning path: Organization of educational material in structured modules that can be exported to a SCORM package.

3.4 Forth course unit

The fourth week is titled "Assessment & Feedback Tools" and consists of the following subsections: i) Exercises: Production of closed-type exercises (multiple choice, assignment, filling); ii) Questionnaire: Creation of polls and surveys, iii) Assignments: Managing, Submitting, and Grading Assignments, iv) Gradebook: Recording of learners' grades, v) Attendance: Recording of attendance / absences of learners, vi) Progress: Receiving rewards and certificates, vii) Statistics: Statistics users.

3.5 Fifth course unit

The fifth week is titled "Presentations and Evaluation of Courses" and consists of the following sub-sections: i) Presentation of an electronic course, ii) Evaluation and commentary of an electronic course using the tools of the system, iii) Evaluation of a e-course, iv) Output questionnaire.

4 IMPLEMENTATION

The specific training program was implemented in four (4) stages: i) publication of the program ii) selection of the trainees, iii) development of the relationship and iv) evaluation.

During the training program, the role of the trainer was to provide advice and guidance.

Each week, the trainer repeated the following steps: i) demonstrated the course unit, ii) demonstrated corresponding learning modules, iii) demonstrated corresponding assignments, iv) created appropriate topics in the forum, and v) announced the beginning of the thematic week .

During each week, he monitored the corresponding forum he had created, and intervened if necessary. Interventions in the first weeks were more demanding and gradually declined. To this end, he also monitored other communication channels, such as messages, chat and wall.

As shown in the following figure (Fig. 4), during the first three weeks of the program, the number of views of e-class was almost constant. The decrease observed in the second and third weeks may be due to the teachers who dropped the training program. During the fourth week, there was a peak (56718 views) and then in the fifth week, there was a decrease in the number of views.

This means that a well-designed teacher training program can motivate trainees to express a high interest in the first few weeks. Also, the designer, with appropriate interventions, can increase the interest of the trainees. The best practice is to do the interventions after mid-term, since it is expected to record a slight decrease in interest towards the end.

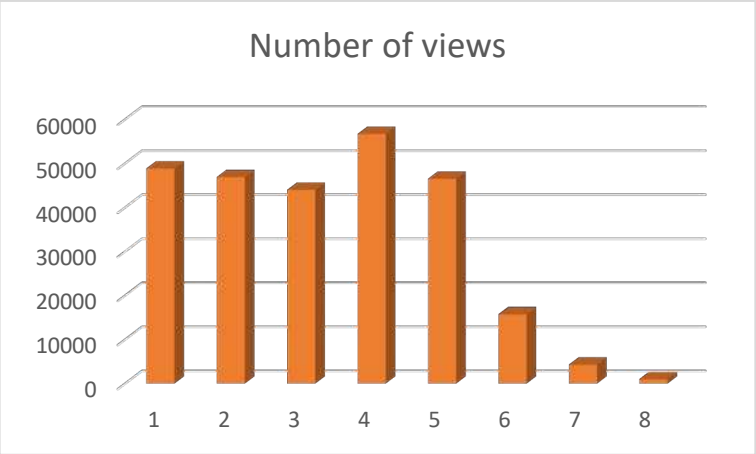

Figure 4. Number of views per each week.

The average number of views was 48607.6 and the standard deviation 4849.6. From the sixth week on, the number of views drops significantly and from the eighth week, it was almost zero.

As shown in the following figure (Fig. 5), during the first three weeks of the program, the duration of connections in the specific e-course was almost constant. In the fourth week, there was a peak (793.7 hours) and then during the fifth week, there was a decrease in the number of views.

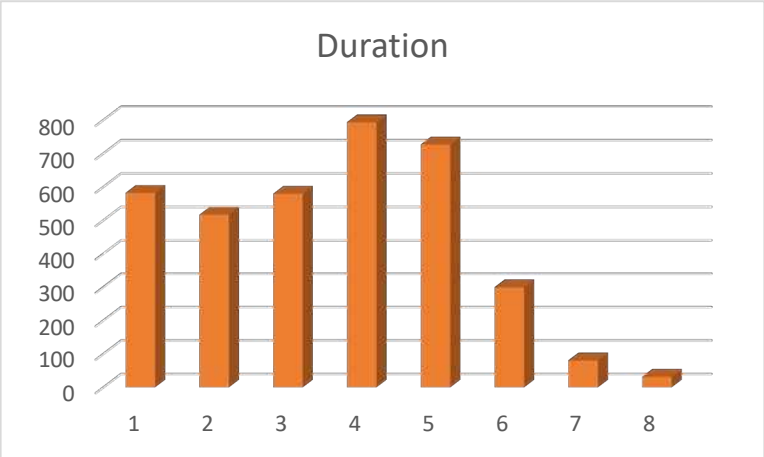

Figure 5. Duration in hours per each week.

The average number of duration was 639.9 hours and the standard deviation 115.5 hours. From the sixth week on, the number of views drops significantly and from the eighth week, it was almost zero.

For seventy nine (79) teachers, who successfully attended the training program, the average duration in the e-course was 40.46 hours, standard deviation 28.06 hours minimum 9.42 hours and maximum 154.67 hours. So, for each week, a trainee was connected to the e-course for almost eight (8) hours.

For forty three (43) teachers, who dropped out of the training program, the average duration in the e-course was 2.40 hours, standard deviation 4.21 hours minimum 0 hours and maximum 25.8 hours.

As shown in the following figure (Fig. 6), the majority of the teachers who started the training program were from Secondary Education. Also, the majority of the teachers who succeeded in the training program were from Secondary Education

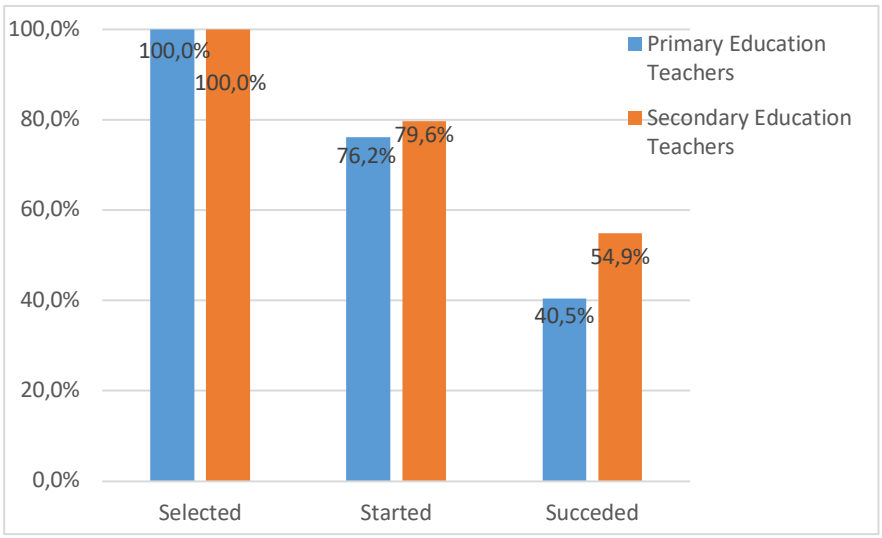

Figure 6. Teachers who selected, started and succeed the training program.

5 CONCLUSIONS

In this paper, the design, development and implementation of an educational teacher training course of an open source LMS, using this LMS, are proposed. The design of this program has been done in such a way so as to demonstrate the Usefulness, Ease of Use, Ease of Learning and the Satisfaction of participants from the use of the particular LMS.

Out of 155 teachers selected, 122 started the program and 79 completed it successfully. The high success rate indicates that one of the most crucial prerequisites for successful implementation of large scale training programs with LMS is the need for careful consideration of the underlying pedagogy and the emphasis on the interaction between users.

REFERENCES

[1] J. Villesseche, O. Le Bohec, C. Quaireau, J. Nogues, A.-L. Besnard, S. Oriez, F. De La Haye, Y. Noel, and K. Lavandier, "Enhancing reading skills through adaptive e-learning", *Interactive Technology and Smart Education*, Vol. 16 Issue: 1, pp.2-17, 2019. Retrieved from https://doi.org/10.1108/ITSE-07-2018-0047

[2] M. Merrill, L. Drake, M. Lacy, J. Pratt, and the ID2 Research Group, “Reclaiming instructional design”, *Educational Technology*, Vol. 36, pp. 5-7, 1966.

[3] S. Britain, and O. Liber, “A Framework for Pedagogical Evaluation Of Virtual Learning Environments”. JTAP, *JISC Technology Applications*. Report 41. University of Wales – Bangor, 1999. Retrieved from http://www.leeds.ac.uk/educol/documents/00001237.htm

[4] K. Kabassi, I. Dragonas, A. Ntouzevits, T.Pomonis, G. Papastathopoulos, and Y. Vozaitis, “Evaluating e-learning management system for blended learning in Greek higher education”. *Springer Open Journal*, 5(101), 2016. Retrieved from https://doi.org/10.1186/s40064-016-1705-8

[5] D. H. Schunk, J. R. Meece, and P. R. Pintrich, *Motivation in education: Theory, research, and applications*. Pearson Higher Ed, 2012.

[6] B. J. Zimmerman, M. Boekarts, P. Pintrich, and M. Zeidner, “A social cognitive perspective”. *Handbook of self-regulation*, 13(1), 695-716, 2000.

[7] S. F. Kazmi, T. Pervez, and S. Mumtaz, “In-service teacher training in Pakistani schools and total quality management (TQM)”. *Interdisciplinary Journal Of Contemporary Research In Business*, March Edition, 2, 238-248, 2011.

[8] J. Y. Sim, *The impact of in-service teacher training: a case study of teachers' classroom practice and perception change*, Doctoral dissertation, University of Warwick, 2011.

[9] D. Kalogeras, K. Dragogiannis, and L. Seremeti, “Training program for teachers: Student's assessment in modern school”. *5th International Conference International and European Trends in Education and their impact on the Greek Educational System*, 2014.

[10] Greek University Network, Accessed 1 May, 2019. Retrieved from https://eclass.gunet.gr/

[11] Greek School Network, Accessed 1 May, 2019. Retrieved from http://www.sch.gr/

[12] N. Xipolitos, M. Paraskevas, and E. Varvarigos, "The Greek School Network: Structure design principles and services offered", *Proc. Int. Joint Conf. E-Business and Telecommunications*, pp. 283-288, 2006.