Online courses on open source software usage by an academic library

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Abstract

This paper describes the e-learning seminar conducted by the Library and Information Center of the University of Macedonia during the first semester of 2007. The courses offered included web browsing and e-mail using open source software, namely Mozilla Firefox and Mozilla Thunderbird. Separate courses were created for Windows and Linux users. Among the issues covered is the design and construction of online courses, the supervision of courses while they were offered to students, the reports on student activity and the evaluation of both the courses and the learning environment from the viewpoint of students.

Introduction

Until recently, academic libraries were viewed as a supportive factor in the learning process and their role was restricted to material provision. Over the last few years, though, the role of libraries in the learning process is being re-evaluated. Libraries themselves are investigating new potential services they can offer and new technologies that can be utilized in this direction. The overall consensus is that libraries need to become more "digital" and offer ubiquitous and seamless access to its resources to users anywhere and anytime. Moreover, a library is no longer a passive information repository; it is a locus of the social phenomena that contribute to knowledge (Budd, 2004).

One area in which libraries are expected to play an active teaching role is information literacy skills. In fact, ensuring that every student becomes information literate should be an expressed goal of every academic library (Owusu-Ansah, 2004). The main purpose of information literacy programs is to enable students to evaluate information and its sources critically and incorporate selected information into his or her knowledge base and value system (American Library Association, 2001). Since the majority of information sources are, at present, digital, computer skills are a prerequisite for locating resources.

During the last few years, the world has also witnessed major changes in teaching and learning paradigms. In particular, asynchronous e-learning has emerged as the learning method of choice in many education scenarios. The widespread adoption of this teaching technique is fueled by the global connectivity provided by the Internet which allows students to access material and tutors virtually anytime and from any location.

Combining the trends and requirements described above the Library and Information Center of the University of Macedonia (UOM) created a virtual learning environment called Telemathea using Moodle (http://moodle.org), which is freely available open source software. Moodle facilitates the creation, management and deployment of electronic courses entirely via the World Wide Web. In the context of the 3rd Community Support Framework and the PLOEGIS project in particular, the UOM Library embarked on the development of online courses with the help of University Professors. The topic of the administered courses was selected to be computer usage with free and open source software.

This paper describes the e-learning seminar on web browsing and e-mail conducted by the UOM Library during the first semester of 2007 which included the courses on web browsing and e-mail and is organized as follows. The next section presents the Library virtual learning environment, followed by a section describing the courses on open source software usage in detail. Finally, the remaining courses are briefly presented.

The Library Virtual Learning Environment

The virtual learning environment Telemathea (http://telemathea.uom.gr) was created by the University of Macedonia Library and Information Center in 2005. Its name is derived for the Greek words tele = far and mathea (actually spelled matheia) which can be freely translated as the outcome of learning. Telemathea was initially envisioned as a university course management system which would serve as an aid to traditional teaching methods. As such it has been used by regular university courses (those related to foreign languages) and by seminars conducted by or related to the University of Macedonia. When used for such purposes Telemathea mainly serves as a document delivery tool which teachers use to hand out lecture notes and other material or announcements to students, and little or no e-learning takes place. However, its focus has changed and since 2007 it is used for fully online seminars as in the context of the project described in this paper. The motivation behind this shift in purpose was the Library's desire to assume a more pivotal educational role.

Telemathea is based on the open source course management system Moodle which is available via its website (http://www.moodle.org) for free, under the GNU GPL (General Public License). The name Moodle is an acronym for Modular Object-Oriented Dynamic Learning Environment. Moodle was created by an Australian, Martin Dougiamas as part of his PhD thesis using PHP and MySQL [Dougiamas and Taylor, 2003]. Dougiamas continues to be the leader of the development team which has since grown and includes developers all over the world. Moodle is nowadays able to support several database management systems (including Microsoft SQL Server and PostgreSQL). Moodle has evolved into a multilingual course management platform maintained by a wide community of users all over the world. Moodle is platform independent and at the time of writing supports more than 70 languages. Its functionality is enhanced by many available modules which can easily be installed on demand.

The primary motive for selecting Moodle over other course management systems was the effort undertaken by the Library and the University of Macedonia in general to replace commercial software with open source alternatives. These alternatives include readily available applications as well as custom applications created to serve particular purposes. Moodle was a natural choice for the library's e-learning platform as it was then and is still now the leading open source course management system in terms of market share. Furthermore, Moodle has a particularly active community with over 250,000 users registered at the official website. Version updates are released frequently and support is readily available in user forums. It is also indicative that several large scale institutions such as the UK Open University chose Moodle as their course management system and that a Moodle Teacher Certification has been established since 2006.

The courses on open source software usage

The topic of the seminars to be offered was selected after research on recent software trends mostly in countries of the European Union. It was observed that the Free/Libre Open Source Software (FLOSS or FOSS) movement is increasingly gaining ground because of its numerous advantages. These include the lack of licensing and distribution costs as well as the freedom to view and/or modify the source code to

suit a particular need or correct a software flaw. The development of open source software is based on an entirely different business model (Raymond, 2001) which largely revolves around online communities of volunteers. Open source software was originally used only be experienced users but recently several applications which do not require advanced computer skills are available. For example, one of the most popular open source applications is the OpenOffice.Org suite which includes a Word Processor, a Spreadsheet, a Database and a tool for creating presentations. Millions of people around the world take exams in order to certify that they have basic or advanced computer skills. The majority of such certification exams are based on commercial software and specifically office automation software. The UoM Library noted the lack of courses and certification exams on open source office automation software and thus selected the usage of open source desktop applications as the subject of its online courses.

Course content was based on material provided by the International Computer Driving License (ICDL) Foundation in South Africa. The ICDL foundation offers these courses in the English language as well as FLOSS certification called open ICDL. The material was offered under a Creative Commons License in order to be translated to the Greek language. Several additions and corrections were made in order to adapt the material for more recent software versions which would be used in the UOM Library seminars. Apart from that, the material was adapted for versions intended for Windows users. All these changes were performed with the consent of the ICDL foundation.

Course preparation and deployment

Course creation began in January 2007 after the translation and editing of the material had finished. The first course to be offered was the Mozilla Firefox web browser and the Mozilla Thunderbird e-mail client. Initially, the courses were to be available to Linux users only but given the fact that this would exclude the majority of potential students, separate courses were created for users of Windows and Linux. Courses were developed by the Asynchronous Learning Team of the UOM Library (consisting of two librarians and an information technology professional) in cooperation with two university professors (authors Margaritis and Dagdilelis for Linux and Windows, respectively).

Moodle offers several tools (resources/ activities) which teachers can use in their courses to deliver content or interact with their students. The main tools used in the UOM Library seminars are summarized in Table 1. Both courses used a topic format mainly because this format does not impose time constraints on the students (as does the weekly format) and allows everyone to study and learn at their own pace. Also, in both courses an effort was made to create "virtual classrooms". Students were encouraged to interact with each other via a separate forum created specifically for communication between students. Indeed, several students wrote posts to introduce themselves and edited their profiles to include additional personal information.

Table 1: A summary of Moodle tools used for course development

Icon - Name	Category	Description
- Forum	Communication	Discussion groups for student-teacher and student-student communication
- Lesson	Learning material delivery	A composite resource which allows teachers to set up a learning path which is changed according to student responses to questions.
- Book	Learning material delivery	A resource that allows teachers to present material in a book-like format.
- Glossary	Additional tools	A resource to display frequently used terms and definitions for reference.
- Resource/ web page	Learning material delivery	This resource was mostly used for topic introductions and synopses.
- Resource/ display a directory	Learning material download	This resource was used to allow students to download learning material in pdf format.
- Assignment	Student evaluation	Several formats of this activity were used in order to assign tasks to

		students.
☑ - Quiz	Student evaluation	This activity was used to check student knowledge of the course material.
❓ - Feedback	Course evaluation	This activity was used to create the course questionnaire.

Each course consisted of 6 learning topics and one evaluation topic. The two courses differed significantly in their structure. The course for Linux used several Moodle tools to deliver content (Lessons, Resources, Books) while the Windows course delivered all content using Lessons. Furthermore, the Linux course included several "small" quizzes which students could take while studying in contrast to the Windows course which had one "big" quiz at the end. Each topic began with an introduction and ended with a synopsis linking to the next topic. It must be noted that both courses offered all study material in Portable Document Format (pdf) files which students could download and read offline. Indeed, several students opted to study exclusively in this manner.
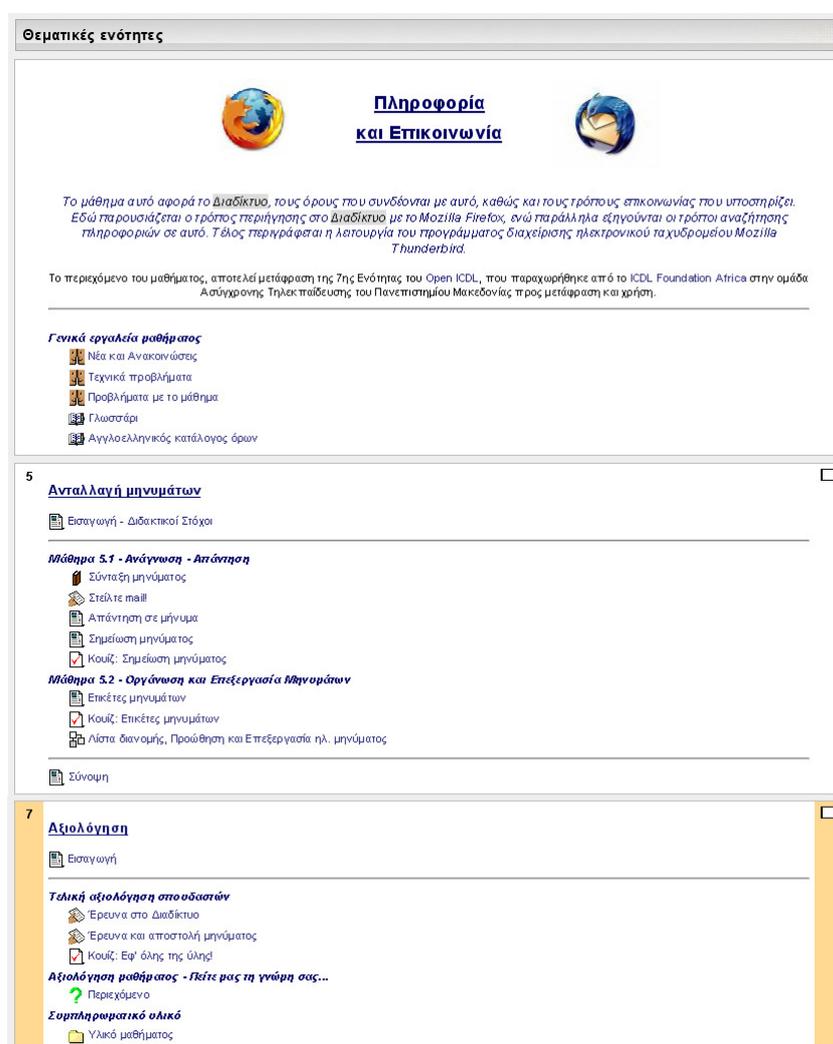
Figure 1: A partial screenshot of the course for Linux users.

Students were selected after a public call for applications. Announcements were posted on the University web site as well as several mailing lists and the Greek School Network website. Forty-seven people were selected, 30 Windows users and 17 Linux users. All students were given a short manual on using the platform and accessing the course via e-mail. Two live sessions were held, one in the beginning of the courses as an introduction and one after their completion in order to discuss the evaluation outcomes.

Students were not required to attend these sessions. Students were required to achieve an 80% grade on course assignments and quizzes as well as fulfill the evaluation activities in order to receive a certificate of attendance (successful completion). The total course duration was set to 2 months.

Students were asked to:

- Study course material by themselves.
- Submit assignments (individual and group).
- Take quizzes.

Students were free to study whenever they liked and were only given the ending date of the course as a final deadline. However, they were advised that the indicative duration for each topic was equal to 1 week and each week a new topic was highlighted as current. Figure 1 is a screenshot of the course for Linux users. The Figure includes the course introductory block, one of the learning topics (5) and the evaluation topic (7). Figure 2 includes the same for the Windows course. All course content was delivered in Greek.
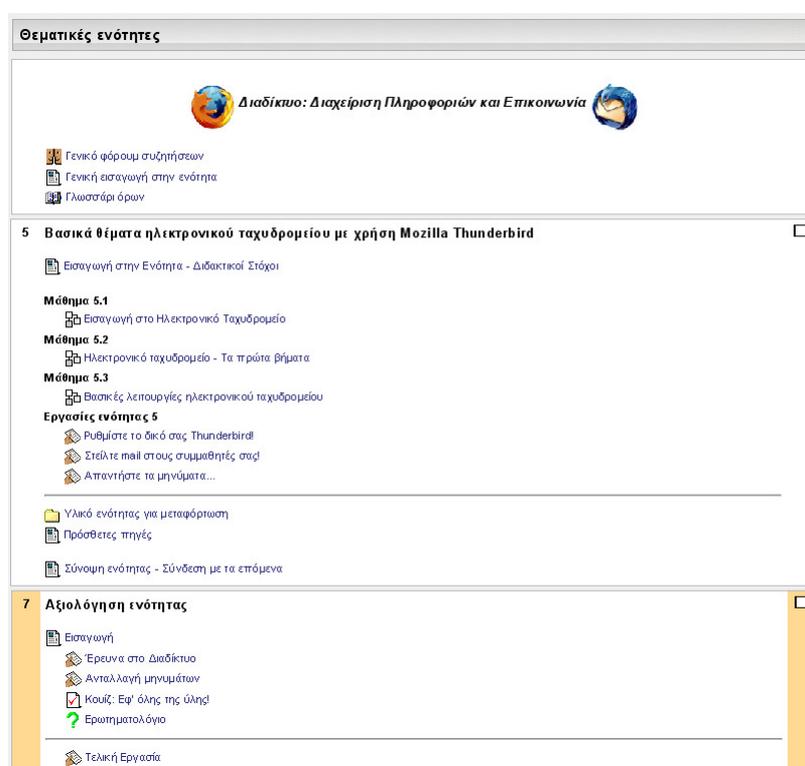
Figure 2: A partial screenshot of the course for Windows users.

The final evaluation of the students consisted of three stages:

1. Individual assignment on the Mozilla Firefox web browser.
2. Group assignment on the Mozilla Thunderbird e-mail client.
3. A quiz covering all study material.

The two participating university professors supervised the courses, replied to student questions or comments and graded their assignments (the quizzes contained only automatically graded questions). To enhance the sense of a "virtual classroom", teachers committed to replying to students (via e-mail or post to forum) within 24 hours. It was observed that the online presence of the teacher motivated students to log in more often or stay online longer rather than study offline and return only to submit assignments or take quizzes. This can be attributed to the fact that their questions were answered promptly which allowed

them to proceed with their study and submit the corresponding assignments or take part in other activities sooner.

Figures 3 and 4 depict the course statistics for both teachers and students for 2007. Spikes are observed at the time periods during which the courses where available to students. Figure 3 summarizes the activity in terms of total item views (items being resources or activities) while Figure 4 in terms of total forum posts. The darker lines represent the teachers and the lighter ones the students.
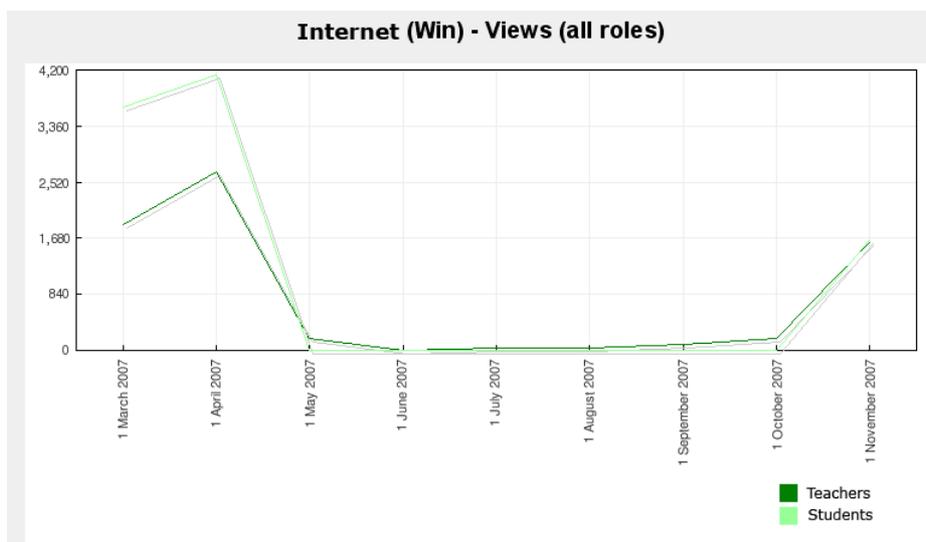

**Figure 3: Teacher and student activity views for year 2007.**
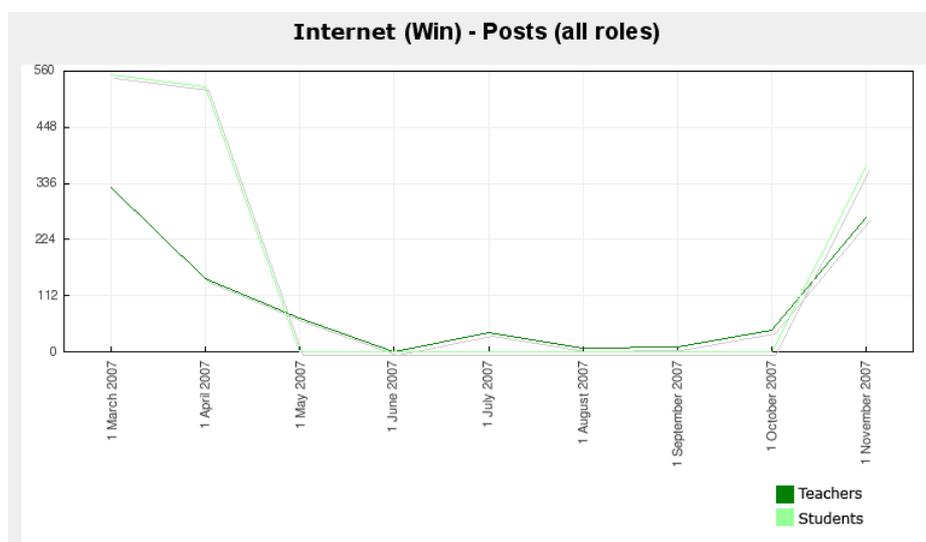
Figure 4: Teacher and student posts for year 2007

Course evaluation

The course evaluation from the student's perspective was performed via a questionnaire. This feedback activity (as it is called in Moodle) contained 37 questions and it was a prerequisite for successful course

completion. All submissions and statistical processing were anonymous. Table 2 summarizes the contents of the evaluation questionnaire.

Table 2: A summary of the student questionnaire

Question category	Intended goal (s)
Informational	Assess whether the learning experience was hindered by technical difficulties (e.g. Internet connection speed). Assess the student pre-existing knowledge on the course topic. Gather statistical information about user background.
Interaction with the learning environment/ course design	Determine any navigation difficulties users had with the learning environment. Assess whether the differences in course structures were significant for students.
Course material	Evaluate the quality and quantity of learning material from the viewpoint of students.
Teacher activity/ evaluation	Assess whether students thought they had adequate support from teachers.
Student activity/evaluation	Allow students to self-grade their performance and participation in the course.

Regarding the analysis of student feedback, it is worth noting the following points:

- A significant percentage (about 60%) of the participating students pointed out the significance of the virtual classroom and stated that an actively participating teacher and the collaboration with other students enhanced their learning.
- Concerning the course layouts and the use of different Moodle activities and resources, both groups of students stated that they found their course presentations satisfactory, therefore the conclusion was that both layouts were successful.
- Several students noted that group assignments were problematic because of significant differences in study pace. Although they enjoyed the fact of working together with other people they disliked the fact that they had to wait for all members of their team to complete (or at least start) their part before they could submit the assignment. On this basis, it was decided that any further group activities (in the courses that would follow) would not cause students to depend on others for submission. The immediate problems were resolved with the intervention of the teachers.

In general, students stated that they were satisfied with the course content, presentation and delivery and that they learned a lot of useful things. A number of students which completed the first seminar applied for other courses as well.

Additional courses

Following the first seminar, the asynchronous e-learning group of the UOM Library reviewed the first two courses, made changes to material or activities where appropriate and proceeded to creating 4 additional courses per user category (thus raising the total number of courses to 10). The first course was entitled "Computer usage and file management using the Ubuntu Linux operating system". The aim of the course was to teach operating system and file management basics. The Ubuntu distribution was chosen because it is considered friendly for novice users and has become quite popular. This course was also offered to people with the Windows operating system (with quite different study material) and was based entirely on the Ubuntu Live CD. Thus, it did not require an Ubuntu installation but merely an operating system boot from the CD. The corresponding seminar took place from November 2007 to January 2008.

The remaining three courses are:
- Word processing using OpenOffice.org Writer.
- Spreadsheets using OpenOffice.org Calc.
- Presentations using OpenOffice.org Impress.

These courses will be available at different time periods during the first semester of 2008. After the end of all courses an overall evaluation of the entire project will be performed.

References

American Library Association (2001). Objectives for Information Literacy Instruction: A Model Statement for Academic Librarians. http://www.ala.org/ala/acrl/acrlstandards/objectivesinformation.htm [viewed September 15, 2007].

Budd, J. M. (2004). Academic Libraries and Knowledge: A Social Epistemology Framework. *Journal of Academic Librarianship*, 30(5), 361-367.

Dougiamas, M. & Taylor, P. (2003). Moodle: Using Learning Communities to Create an Open Source Course Management System. In D. Lassner & C. McNaught (Eds.), Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2003 (pp. 171-178). Chesapeake, VA: AACE.

Owusu-Ansah, E. K. (2004). Information Literacy and Higher Education: Placing the Academic Library in the Center of a Comprehensive Solution. *Journal of Academic Librarianship*, 30(1), 3-16.

Raymond, E. S. (2001). *The Cathedral & the Bazaar*. O'Reilly Media, Inc., California.