Implementation of a Computer-Based Course on Moodle

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Abstract: Increasing popularity of Internet led to expectation of course materials and activities to be distributed and collected online. Many universities have already started to support the courses with the technology. But most of them are still lack of a structured, well designed Learning Management System. Therefore, instructors in these universities are still distributing course materials (like presentation files) to students at the end of their lectures and collecting assignments by email. This approach is open to many problems. Being aware of these problems, Epoka University started a pilot implementation of Moodle in 2010. This study presents experience of this implementation on a computer-based course (C Programming) which is aimed to be useful to the other education institutions.

Introduction

The recent advancements in Information and Communication Technologies (ICT), especially Internet, generated a need and an expectation of presenting courses online. It is becoming evident that on-line education will become an integral part of higher education in the foreseeable future (Nakos et al., 2002). Many universities have already started to offer on-line education, or simply "e-learning" which aims to eliminate the dependency to the traditional classrooms and/or improve the learning environment (Eastman & Swift, 2001). But most of them are still lack of a structured, well designed online Learning Management System (LMS). Therefore, instructors in these universities are still distributing course materials (like presentation files) to students at the end of their lectures and collecting assignments by email. This approach is open to many problems. For example, some students complain for not being supplied with the course materials and some claim that they have emailed the assignments which are not received by instructor.

Being aware of the mentioned problems, Epoka University started a pilot implementation of Moodle, an Open-Source Free Learning Management System, in 2010. This study presents experience of the pilot implementation of Moodle on a computer-based course (C Programming), considering that this experience may be useful to the other education institutions.

Open-Source Learning Management Systems

Interest in open source has grown exponentially in the recent years. In mid January, 2005 a Google search of the phrase "open source" returned approximately 28.8 million webpage hits (Kapor, 2005). That number jumped significantly to 376 million when a similar search was conducted on October 12, 2006. There seems a high increasing interest in open source software (Pan and Bonk, 2007).

Wikipedia defines Learning Management System (LMS) as "a software package, usually on a large scale (that scale is decreasing rapidly), that enables the management and delivery of learning content and resources to students." The LMS allows students to register for online courses, delivering and tracking e-based

learning courses, testing and much more. The tools used in LMS include email, chat groups, grade books and interactive quizzes. It is designed to manage the educational courses online to help the teachers and students with course administration (Cheung, 2006).

Moodle LMS

MOODLE (Modular Object-Oriented Dynamic Learning Environment) is an open source Learning Management System (LMS) created by Michael Dougiamas (http://dougiamas.com) to serve as an online interactive environment between educators and students. Sometimes it is referred to as a course management software or virtual learning environment. Moodle is defined on its official website as: "A course management system (CMS) – a free open source software system designed using sound pedagogical principles to help educators create effective online learning communities" (Moodle, 2010).

Moodle is widespread all over the world in more than 200 countries with 50,000 registered installations according to the project website. Among them are the public educational institutions as universities and schools as well as private institutions (Wikipedia, 2010).

Moodle presents the following advantages for acquiring as a learning management system (Goba, 2004).

1. Being free of charge without any advertisement. It allows full control of settings and editing. Its extensibility enables adding new functionalities by installing plug-ins called modules.
2. Using as a content based web management leads to a modular object oriented dynamic learning environment. Online courses can be easily integrated and files may be archived and saved online.
3. Providing collaborative medium where everybody can meet and communicate.
4. Getting support and help easily. By clicking on the help symbol a pop up window opens offering help.
5. Other advantages include easy installation on any platform, interfaces in more than 50 languages and extensibility by adding new modules created in PHP script.

Moodle can run on any platform like Windows, Unix, Linux, Mac OS X which supports PHP. In order to implement Moodle some software requirement must be fulfilled. First a web server with PHP is needed. As a web server IIS (included in windows) or Apache (http://httpd.apache.org) can be used. The platform on which Moodle will run must support many types of database systems like mySQL or Oracle.

The whole free Moodle software package (Moodle, PHP, MySQL and Apache) can be downloaded from the official website of Moodle.

Implementation

1.8 version of Moodle was downloaded from the vendor's official web site (http://download.moodle.org) and installed on a Windows server which runs MySQL Database Management System and Apache Web Server.

After some server settings had been done, course categories were defined and some courses were created under these categories. We preferred to create the main categories as the name of the Faculties. Then under each faculty category, we created subcategories as the name of the Departments. The current faculties and departments of the Epoka University (the main and subcategories in Moodle) are as follows:

1. Faculty Of Engineering And Architecture
    3. Computer Engineering
    4. Civil Engineering
    5. Architecture
2. Faculty Of Economics And Administrative Sciences
    3. Economics
    4. Banking and Finance
    5. Business Administration
    6. Political Science and International Relations

Courses were created under related Faculty/Department categories. This approach led both instructors and students access their courses rapidly.

To start using the Moodle, firstly, the accounts of course instructors (teachers) and all the student accounts in Epoka University were created by using a batch file. Thanks to its practicality, Moodle allows to create user accounts from a batch CVS file including some essential account information like username,

password, email, first name, last name, etc. Then related system roles have been assigned to course creators and teachers using Site Administration panel which is only visible to Administrators. The related screen is shown in Figure 1. The other accounts are assigned "Student" role by default, eliminating to bother for assigning this role to a lot of users.
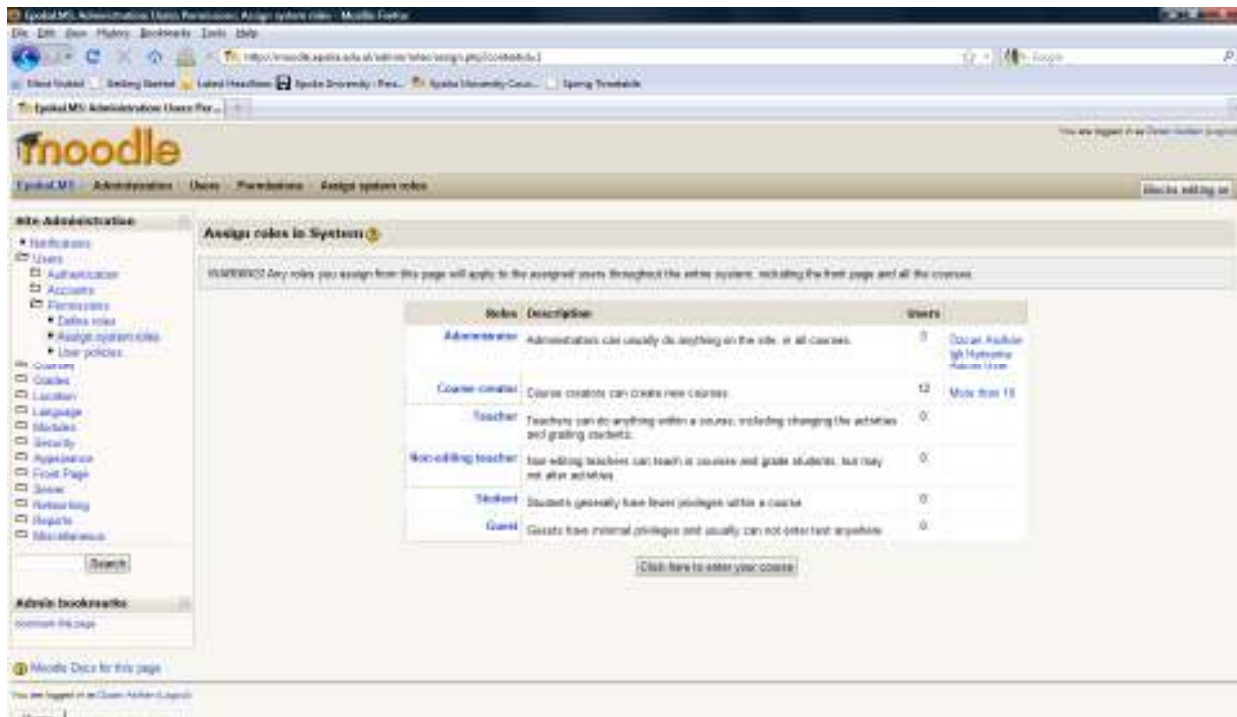

Figure 1: Site Administration Panel of Moodle: Assigning roles in System

Instructors started to customize their courses by editing the contents online. After they had informed the students during the classes about how to access the course by using their accounts, students started to benefit from accessing their course contents online.

Figure 2 displays the main welcome page of the Epoka University Learning Management System, http://moodle.epoka.edu.al which was customized to display the categories, courses, latest news, calendar and online users, considering that these are the most useful items that should exist on the welcome page. Main page also includes a combo button on the upper right side to change the language. It includes a rich set of different languages.
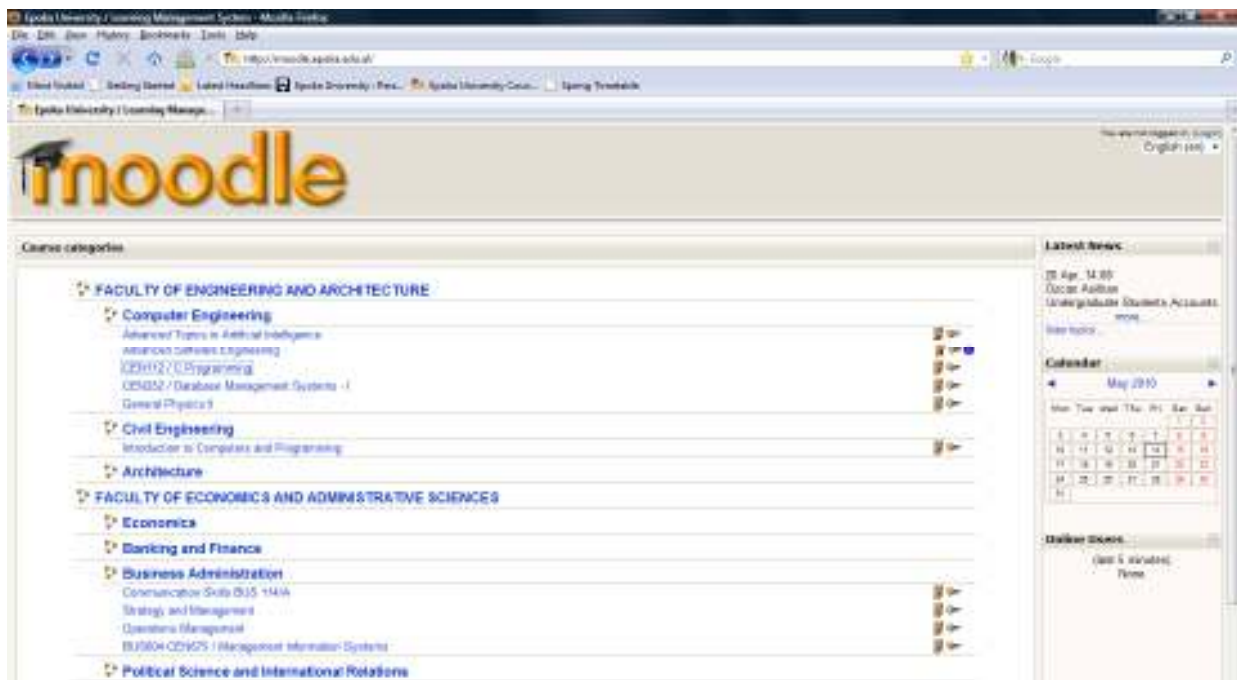
Figure 2: Main welcome page of Epoka University Learning Management System

Both instructors and students can access their courses simply by clicking the related course name link. It will take them to the login screen as shown in Figure 3 (It is also possible to click on the login link on the upper right side of the page).
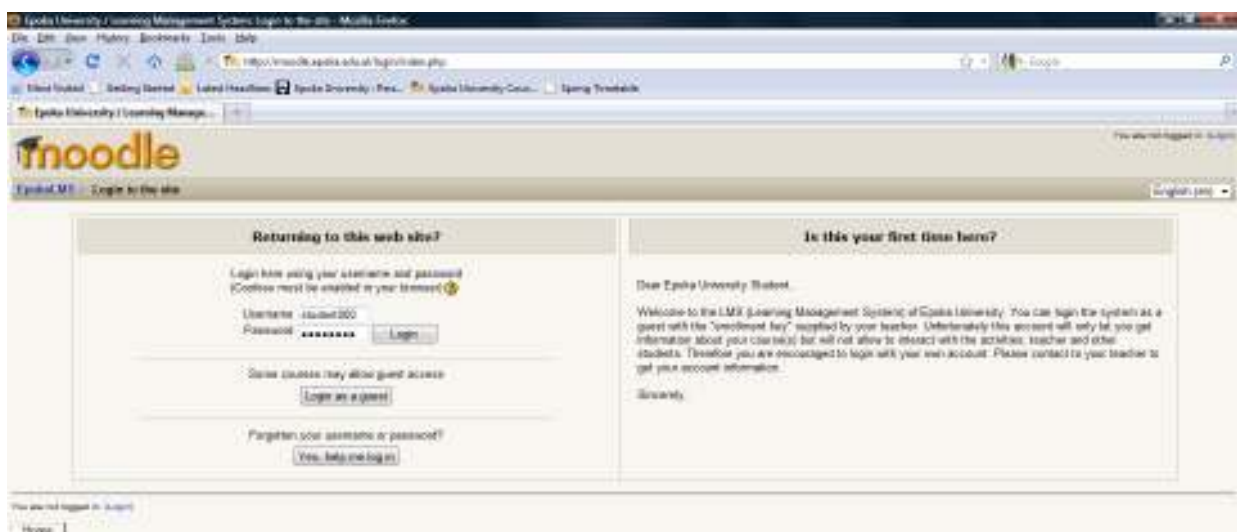

Figure 3: Login screen

This page allows users to login the course site with the owned account or as a guest. Moodle allows instructors to distribute a unique "enrollment key" of the course to all the class without the need to create accounts of all the students. This key has two benefits: First, anyone without an account can enroll the course as guest. Guest users can access all the course contents except interacting with activities like participating quizzes, submitting assignment, etc. The instructors that do not use such activities and just need to distribute online course materials to their students can highly benefit from enrollment key. They do not need to bother with the accounts of their students. Second, enrollment key prevents other users (including those who have the account in the system, like students of other classes), to access the course materials if they are not supplied with this key. Enrollment key functionality can be customized by the instructors in the Course Settings section in their administration panels.

On the login page, there's one more option allowing users (like students) to create their accounts by clicking "Create a new account" button on the page. After users create account, a confirmation mail is sent to the administrators to approve the new account. For some technical reasons, we didn't prefer to allow this option for now and hid that button.

In order to give an idea about the implementation of Moodle, we will enroll to a sample course, "CEN112 / C Programming", with a test student user account (student000) and present the course contents with the perspective of a student.

After entering username and password and login the first time, students will be asked for the enrollment key that their instructor has given for this course. After entering the correct enrollment key, the students will face the contents of the course as shown in Figure 4.
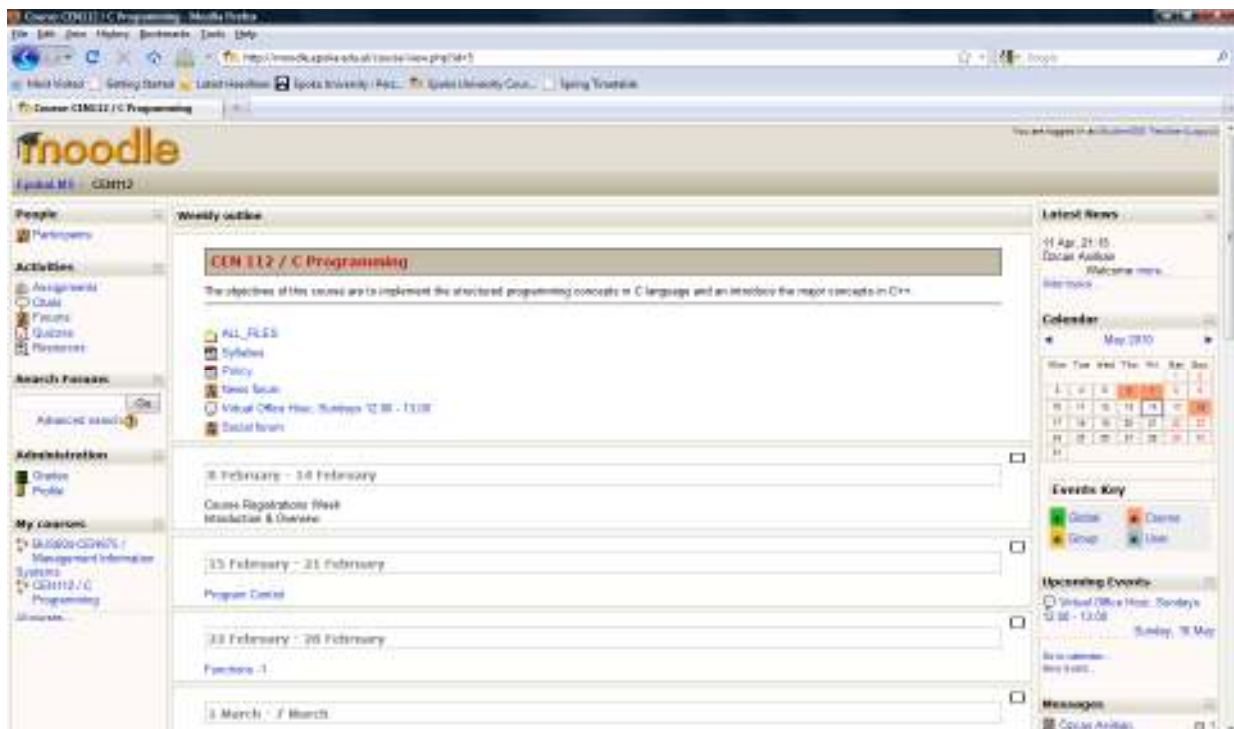

Figure 4: Course Content Site

Main page of the course includes major three parts. On the left side, there exist some panels like People (participant list), Activities (assignments, chats, forums, quizzes, resources, etc), Search, Administration and enrolled Courses. On the right side, there exist Latest News, Calendar, Upcoming events, Online Users and Messages specific to logged user. In the middle, the Course Outline is shown. Actually, almost all these parts can be customized by the instructor of the course, as the sample course page was already done.

Throughout the following parts, we will have a more detailed look into some of the parts that we have implemented so far. We will skip items whose functions can easily be understood (like Search Forums)

Left Part

Left part of the course page includes several links that display different lists or events.

Participants link displays the list of students enrolled the course. Assignments and Quizzes links display all the assignments (homework, project, etc.) or quizzes prepared by the instructor. Chats section display chat sessions defined by the instructor. Forums section allows students to discuss and cooperate during their studies and is an effective tool for the instructors to monitor their students' work.

Resources section allows students to upload files to in order to share with the others.

Grades section allows students to see their grades earned from the evaluation of online quizzes and assignments.

Profile section allows students to update their profiles like adding birth date, picture, etc.

Right Part

Latest News section serves like an information board containing the recent news entered by the instructor, for example the announcements of class hour change, new assignment, exam date, etc. Items in this section are located starting from the most recent one to the oldest one. By clicking, "more" under each news, full explanation can be accessed.

Upcoming Events section displays future events (like scheduled chat sessions, quizzes, etc).

The message section displays a list of new messages that logged user has received, with a link to detailed messages window.

Middle Part

In the middle of the main page, a description of the course was entered. Following the description, a link to all the files (ALL_FILES) was inserted to allow the students to see easily and to access directly the course materials. All the files used in the course have been saved under folders in a structured manner. After some experiments we have decided to use the following folder names:

- Assignments: Stores the files explaining the homeworks, projects, etc.
- Class_lists: Stores various lists of students, like attendance list, grade list, project list, etc.
- Lectures: Instructor' s class presentation files
- Notes: Instructor's class notes, Syllabus, Policy, etc..
- Student_Files: Files uploaded by the students.
- Teacher_Files_Private: Private files of the teacher like exam questions.
- Videos: Video files
- eBooks: Electronic books

Links to Syllabus and Policy of the course were also put on the front (main) page. Actually these files already exist inside some categories under ALL_FILES, but displaying the shortcuts to these critical files on the main page was considered to be useful so that students can easily see them.

The major section of the middle part is Course Format. Moodle allows different course formats like topics format, weekly format, etc. We preferred to use weekly format and organized the course in 16 weeks with a clear start date and a finish date in each week. The course outline was distributed to related weeks including links to related lecture files and activities. Some activities are shown in figure 5.

Figure 5: Sample activities in the week format

In week 12 (26 April – 2 May), a Homework activity has been entered. Students can click this link to see the detailed explanation of the homework. After preparing their homework, they can upload the related files

and input some explanation here. Hence, instructor can easily collect all the homeworks in this section and even evaluate them online.

In week 13, a Quiz activity has been entered. Quiz becomes active on the date and time specified by the instructor, mostly during the practice hour in the computer laboratory. Students are expected to answer the questions in a limited time. If allowed by the instructor, they can also see correct answers, their grades, and instructor's evaluation notes later by clicking the same activity.

In week 14, a video resource has been entered. Student can watch the video uploaded by the teacher.

In the last week, final exam date and an instructor note have been entered.

Conclusion

This study presented the implementation of an online course in Epoka University by using Moodle LMS. The great features of Moodle led to successful implementation of a web based course.

The course allowed the students downloading course materials easily, being informed by the recent news, taking online quizzes, uploading assignments and sources, participating in forums, etc. On the other hand, it allowed instructors to easily distribute course materials, announcing assignments and collecting them, applying quizzes and evaluating them in an online environment without burdening the hassle of email traffic.

This collaborative learning experience has been found very user friendly and efficient by the students and instructors. It encouraged collaboration among students and contributed much to the increasing participation of the students.

As the interest in Moodle is rapidly growing within e-learning community, we highly suggest education institutions to use Moodle LMS in order to improve the total satisfaction of their students and instructors.

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