

A Learning Management System Developed at the Eastern Mediterranean University

Işık AYBAY and O. Oğuz DAĞ
Distance Education Institute
Eastern Mediterranean University, Magosa, North Cyprus
Email : isik.aybay@emu.edu.tr

ABSTRACT

Distance education programs are becoming more common in traditional higher education institutions. Some universities are offering courses from their online programs to on-campus students, while others are establishing special programs for their students. Learning Management Systems (LMS) are essential for content development and management of such programs. This paper discusses the Eastern Mediterranean University Learning Management System (EMU-LMS) developed while the EMU-Online program was offered to on-campus students, outlining both technical details, and administrative issues.

KEYWORDS : Learning Management Systems, Distance education, Online education.

1. INTRODUCTION

In the last ten years, many universities and higher education institutions have started offering distance education courses for their on-campus students (2, 5, 7). This serves a number of purposes :

- a) The university gains experience on online course development,
- b) The university gains experience on the management of online programs and this possibly leads to the establishment of an institute/center specialized in distance education methods,
- c) The students taking online courses return quick feedback on the program,
- d) The distance education institutes/centers train a sufficient number of teaching staff/assistants who are qualified in developing distance education programs.

Considering the importance of all these purposes, and believing that distance education will play a more important role in the education system, in the year 2000, the Eastern Mediterranean University (EMU), has started the EMU-Online program (6, 7), mainly targeted for on-campus students. In the first five semesters, a total of ten courses were taught, each one a number of times and more than 1,000 students have taken these courses. In the current semester (Spring 2003), six courses are offered and 283 students are registered to these courses.

Considering the requirements and feedback coming from EMU-Online instructors, the EMU Distance Education Institute (EMU-DEI) has developed a Learning Management System (LMS) called EMU-LMS (1). The main requirements for developing such a LMS were :

- a) The instructors needed an announcement management tool which would list announcements on course work and assignments to students for certain durations,
- b) The institute needed to keep track of which students were registered to courses, and for security reasons, assign passwords for access to online course material.
- c) The instructors needed online support for assessment, as online quizzes,
- d) The instructors needed an online discussion program,
- e) The instructors needed a discussion board system to start threaded discussions on course work,
- f) The students and the instructors needed support for online submission of course work and assignments,
- g) The instructors wanted to see the 'online attendance' of students throughout the semester.

Hence, a LMS seemed to be inevitable to use Internet efficiently and to create a higher level of interaction between the instructors and the students.

At this point, there were two options :

- a) Purchase a LMS available in the market,

- b) Develop a LMS in-house, with the university's human and financial resources.

The decision was to develop an in-house system for the following reasons:

- a) To provide better solutions to problems encountered in the EMU-Online program, quickly and interactively,
- b) To develop a low-cost LMS as the funds allocated for the program were limited,
- c) To develop a scalable system, which can expand as new requirements were met and as new funds were available,
- d) To be independent of private companies which may ask for extra financial resources for upgrades, or which may stop supporting their software in case of financial trouble,
- e) To compete better with other universities using in-house built tools open for further development.

Eventually, with the experience and expertise gained from the EMU-Online program, a vocational online diploma program on Information Management is offered over the Internet in the 2002-2003 academic year for the first time. The program has a one week face-to-face orientation at the beginning of first year. The first group of students who are registered to this program have recently visited EMU for the orientation program.

This paper discusses the main properties of EMU-LMS, making comparisons with commercially available LMS products whenever it is appropriate. In the following section, various modules of EMU-LMS will be explained. In section 3, a comparison of EMU-LMS and prominent commercial LMS products will be provided. Conclusions and topics for further study will be given in section 4.

2. MODULES OF EMU-LMS

In this section, various modules of EMU-LMS will be discussed. For each module, the following information shall be given:

- a) The module name,
- b) The user-types that can access that module,
- c) A short description of module functionality,

Comparisons, whenever appropriate, will be made with two commercially available and widely used LMS's : the WebCT (4) and Blackboard (3) systems, and with a similar LMS developed at the Middle East Technical University called Net-Class (8). For some modules, advantages and disadvantages of EMU-LMS compared to other LMS programs will be listed.

2.1 User Enrollment

The module handles basic requirements of a LMS such as adding a new user (student or instructor) to the system, modifying properties of existing users and deleting users. Arranging the user accounts properly increases the system efficiency. This module is used by administrators, and instructors (partially). Users can be assigned to individual courses. If a user has no course assigned, he/she stays in the system until the administrator deletes the user to a course, or assigns courses to that user.

In both BlackBoard and WebCT, users can be added to the system over the Internet. In EMU-LMS, this operation can be done by the administrator. Assignment of already existing users to courses can be done by instructors.

2.2 Category Management

With this module, courses can be categorized and put into special folders for further references. This helps to group the courses according to the programs in which they are taught. This module is used by administrators. It provides an opportunity to group together courses of a program.

2.3 Course Management

The main properties of a course like the number of students, the instructor, or the name of the course can be modified in this module.

The Course Management module is linked to some sub-modules. These sub-modules are :

- a) Assignment Management, which helps instructors in posting up assignments on a course. Problem/question files can be uploaded to the server, to be downloaded by the students.
- b) Quiz Management, with which instructors can design online quizzes for assessment, typically one at the end of each chapter.
- c) Announcement Preparation, which is a tool for automatic announcement/deactivation of announcements coming from instructors with deadlines associated.
- d) Discussion Board, which is essential for threaded discussions that will be started by instructors. Students respond by posting their opinions/findings on the issue. This module is one of the most important tools for interactivity.

These sub-modules will be discussed in sections 2.5, 2.6, 2.7 and 2.8.

Courses can only be created by the administrator. This makes the system stable and reliable. Instructors can access all the sub-modules.

2.4 Lecture Management

Instructors can create lecture notes, course outline or syllabus by using this module. One advantage of this module is that, instructors can prepare their lecture notes independently, without any need for learning a new editor, using general purpose editors with which they are experienced, such as Macromedia DreamWeaver, Microsoft FrontPage or Home Site. They upload files prepared with these editors to the site. Broken links in the navigation bars of web pages are avoided by this method, because all the links are kept in the database.

Some uploading tools are implemented in BlackBoard and WebCT, but they are not aimed for lecture management. Lectures are prepared in their built-in HTML editors. For instance, BlackBoard has the What You See Is What You Do (WYSIWYD) editor for this purpose.

2.5 Quiz Management

EMU-LMS supports four types of questions in a quiz:

- a) multiple choice,
- b) true/false,
- c) essay,
- d) fill in the blanks.

This tool uses a Question Database which keeps quiz questions of all courses. An instructor can import questions from this database into a new quiz. The tool also keeps a student list and quiz grades. Individual and overall quiz averages are computed automatically. The instructor can see whether a student :

- a) has taken the quiz and is graded,
- b) has taken the quiz but is waiting for grading,
- c) has not taken the quiz yet.

WebCT has 5, BlackBoard has 7 different question types. A general question database is used in both systems. Exam duration, answer feedback and multimedia file attachment support are also included in both systems. BlackBoard has password-protection feature for quizzes.

In EMU-LMS, two types of quiz evaluation are used, student-by-student and question-by-question. This is an advantage for an instructor, because it makes the evaluation easier. Exam time limit check is not implemented in EMU-LMS. Time limit may be an important parameter for an online exam, it helps to measure the students' performance with a certain time limitation.

2.6 Announcement Preparation and Handling

Announcements are important guidelines for online students. The instructor can announce exam dates, online chat hours, information about upcoming events, or results of assignments by using this tool. Scheduled

events can be posted and removed using provided posting/removal days. When the deadline passes, the announcements disappear automatically. Announcements can be added, modified or deleted by instructors.

BlackBoard and WebCT use a time-schedule for announcements. Both systems give the right to post announcements to the instructor. BlackBoard provides an opportunity of automatic announcement creation for events such as quizzes, and grade announcements.

Automatic announcement creation is not implemented in EMU-LMS. On the other hand, allowing the instructor to post announcements can reduce the work of the administrator.

2.7 Assignment Management

Assignments have an important role in measuring the performances of online students. There are three type of assignments supported by EMU-LMS :

- a) **(one-to-all)** one assignment is given to the whole class,
- b) **(multi-to-all)** multiple assignment topics are given to the whole class. The students can choose one of the topics given. One topic can be chosen by more than one student.
- c) **(one-to-group)** assignments are given to groups of students.

File uploading is also available and is optional for all three types of assignments. The instructor can enable or disable file uploading while choosing the assignment type.

Group work for assignments is allowed in BlackBoard, but not in WebCT. Tracking of students on assignments is supported in both systems. Assignments can be scheduled for later use.

The major advantage of EMU-LMS is automatic creation of a forum to discuss topics related with the assignment. The moderator of that forum is also automatically assigned while students are taking the assignment.

2.8 Discussion Board

The discussion board tool is helpful for the students to start a discussion on a course-related topic, to ask questions, or to share their ideas with the other students taking the course. Administrators have full permission (like creating a forum, deleting messages etc.) over discussion boards of all courses. The instructor can only control the discussion boards of his/her own courses. The students can have limited control on specific forums if they are moderators of those forums.

In the discussion boards of BlackBoard and WebCT, modification of a specific message is allowed. A search opportunity is provided through the forum. An indication of new postings is helpful for the users.

One advantage of EMU-LMS forum management is the automatic creation of forums according to the assignments. When an assignment is given, a forum is automatically created and reserved for discussions on that assignment.

2.9 Student Tracking

Two types of student tracking are possible in EMU-LMS. One is tracking the time spent in the pages of a course, and the other is recording the time between a student's login into and logout of the system. The administrator can see student tracking details of all the courses. The instructor can see only his/her courses' student tracking details. User name and surname, how many times he/she accessed the online course, and how much time he/she spent in the course and/or the system are shown to the administrators or the instructors. With this tool, users who are logged on can get a list of current users. Online users are grouped according to the place where they are working.

Both BlackBoard and WebCT allow tracking of users in different areas of the course, also give statistical reports and graphical views of those statistics.

3. COMPARISON OF EMU-LMS AND OTHER LMS PROGRAMS

In this section, a comparison table is provided which outlines a comparison of some attributes of EMU-LMS with two commercial (WebCT and Blackboard) and one institutional (NetClass from the Middle East Technical University at Ankara, Turkey) LMS programs.

	BlackBoard	WebCT	Net-Class	EMU-LMS
Forum Management				
Can students manage the forums?	Yes	No	No	Yes
Can messages be searched by contents?	Yes	Yes	Yes	No
Is message modifying allowed?	Yes	Yes	Yes	No
Automatic forum creation related with other tools?	No	No	No	Yes
Quiz Management				
Different types of questions supported	7	5	2	4
Is there any question database?	Yes	Yes	No	Yes
Can a time limit be imposed for quizzes?	Yes	Yes	No	No
No of. attempts allowed to participate into a quiz	Multi	Multi	1	1
Can a feedback be given for the answers of questions?	Yes	Yes	No	No
Student Tracking				
Tracking a user's access to different areas of courses?	Yes	Yes	Yes	No
Is there an option for getting a statistical report?	Yes	Yes	Yes	No
Announcement Management				
Can announcements be scheduled?	Yes	Yes	No	Yes
Can the instructor post announcements?	Yes	Yes	No	Yes
Assignment Management				
Types of assignments supported	7	1	1	3
Can students work as a group on assignments?	Yes	No	No	Yes
Can student work on the assignment be tracked?	Yes	Yes	No	Yes
Is scheduled assignment allowed?	Yes	Yes	No	Yes

Table 3.1 Comparison of Four Learning Management Systems.

Some comments on Table 3.1 are as follows. Firstly, in general, as indicated in Section 2 and in Table 3.1, EMU-LMS carries most of the functionality of commercial LMS's. The authors believe that the tools provided by EMU-LMS, and discussed in Section 2, form a minimal basis set for a LMS.

Secondly, since EMU-LMS is not a commercial tool, it lacks some functionalities like tracking a student's access to subsections of course pages, giving meaningful feedback to quiz results, or limiting the duration of a quiz. Additional options like those can be added to the LMS in time. They are not among the basic functionalities required, however, their presence certainly adds a lot to the quality of the system.

4. CONCLUSION

A learning management system is considered to be an essential tool for a modern distance education system. An organization has two options considering its choice of LMS. The first option is to buy a commercial product which will be costly and which might be difficult to maintain and upgrade. The second option is developing its own LMS. This will require time and human effort for the development. However, the resulting

product will be the property of the university, and it will be more easily maintained and upgraded. EMU has chosen the second option.

EMU-LMS is developed by considering the needs of online instructors teaching for an experimental system called EMU-Online, which has also worked as a test-bed for the modules developed. Consequently, we believe it contains all the essential tools for a LMS.

For further development of the system, online calendar, online grade-book, and syllabus-preparation modules which are present in commercial LMS packages can be added. Discussion board and announcement tools can be tuned with other LMS packages after some minor modifications. The quiz management module can be enhanced by increasing the types of questions, allowing multiple attempts, and arranging time-limits for the quizzes.

5. REFERENCES

1. O.O. **Dag**, “Distance Education Toolbox”, MS Thesis, Eastern Mediterranean University, 2002.
2. B. **Nasseh**, “A Brief History of Distance Education”, <http://www.seniornet.org/edu/art/history.htm>
Link last visited on July 25, 2002.
3. <http://company.blackboard.com/clients/index.cgi>
Link last visited on July 25, 2002.
4. http://www.webct.com/company/viewpage?name=company_webct_customers
Link last visited on July 25, 2002.
5. H. **Sarper**, I. Aybay, “Program Information, Network and Software Properties of Some Online Education Programs”, BAS’2001, G.Magusa, 2001.
6. I. **Aybay**, “Eastern Mediterranean University EMUOnline Experience”, International Open and Distance Education Symposium, Eskisehir, Turkey, May 2002 (in Turkish).
7. H. **Sarper**, “Distance Education at the University Level; Examples, Models and the EMU-Online Experience”, MS Thesis, Eastern Mediterranean University, 2001.
8. S. **Basaran**, N. Yalabik, U. Kiziloglu, “Net-Class: A Multilingual Web Based Learning Management Tool”, International Symposium on Computer and Information Sciences XVII (ISCIS), Orlando, Florida, USA, October 2002.