Development and evaluation of a course support environment

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Abstract: - Course-support environments are an important technical development relating to computer communications in education that involves the linking of a Web-compliant user interface and Web-compliant tools and applets with an underlying database. This paper presents a course-support environment that was designed in the Blackboard Learning System in the Media Informatics Lab of the Journalism & Mass Communication Department, at the Aristotle University of Thessaloniki, Greece. Special issues relating to the development of the environment are reported in detail, along with an initial evaluation from the students.

Key-Words: - Internet, Education, Course-support environment, Blackboard Learning System.

1 Introduction

The information age has created many challenges for the traditional established educational institutions. The Internet is the dominant powerful tool for information exchange and communication. The educational sector is without doubt a major market for computer communications applications and services [1]. The most dominant form of computer-aided communication is the World-Wide-Web (WWW), or simply the Web. The use of the Web has been adopted into every aspect of the educational life and each educational activity seems to be covered by a Web-enhanced teaching system [2-6]. Well-designed Web-based teaching tools can significantly enhance student learning, while decreasing the time spent in traditional classroom lectures [7].

Web-based educational systems are asynchronous, that is, they do not require simultaneous presence of instructor and students. Already prepared lectures are available via the Internet through Web browsers. The front-ends are most often designed in HTML, enriched by Java, JavaScript, or Dynamic HTML. The Web enables worldwide access independent of time and location. Using such systems does not require expensive equipment. A personal computer, nearly any operating system, a Web browser, a modem, and a telephone connection enable entrance to the Web and thus to Web-based educational systems [8]. While Web-based teaching tools are commonly used in distance learning applications, they also provide an opportunity to significantly enhance on-campus learning [7-8].

An important technical development relating to computer communications in education involves the linking of a Web-compliant (i.e., accessible via a Web browser) user interface and Web-compliant tools and applets with an underlying database. Thus, a new type of system called course-support environment appeared [1,9].

Since the beginning of 1998, the Media Informatics Laboratory of the Department of Journalism & Mass Communication (J&MC), at the Aristotle University of Thessaloniki (AUTh), Greece, started to develop and publish material on the Web for its conventional courses [10]. The laboratory web site can be reached at http://pacific.jour.auth.gr (in greek). The purpose of this effort has been mainly the support of the media informatics courses and the preparation of a future distance-learning course. Initially we have developed a course support environment with the help of commercial application that creates and manages web sites. This solution gave us a lot of experience about designing course support environment. Results of our effort were published in several papers [11-13]. But of course this solution had many limitations. Last year the Aristotle University of Thessaloniki has purchased and installed a commercially software tool, namely the Blackboard Learning System (http://www.blackborad.com). Thus we were able to transfer and enrich our course support environment to this new platform that offers us many new possibilities (http://blackboard.lib.auth.gr).

This paper presents the development of a course support environment for teaching internet search courses with the help of Blackboard Learning System. The rest of the paper is organized as follows: The course support environments are discussed in Section 2. The Blackboard Learning

system is briefly presented in Section 3. Section 4 includes a brief description of our course support environment. The evaluation of the course support environment is presented in Section 5. Concluding remarks and future extension of this work can be found in Section 6.

2 Course support environment

In a course-support environment a database is integrated with Web-based tools and applications, and used to generate a course-support environment accessed via a standard Web browser. In its simplest form, a course-support environment is a Web site that accompanies an existing course and contains some information about the course. The purpose of such sites is to enrich or increase the efficiency of some aspects of course participation, and/or make some aspects of course participation more flexible to better meet the needs of individual students. Flexibility can also allow the extension of traditional courses to nontraditional audiences, including those who could be described as distance-education students [1]. Course-support sites can be created and maintained by the individual instructor, but increasingly such sites are maintained as part of an integrated system serving an entire department or faculty [14].

In terms of the needs of a critical mass of users, quality of service indicators relating to high-bandwidth applications, such as videoconferencing, are less important than indicators relating to secure connections to the database systems that are rapidly becoming integrated with Web-based course-support environments. We agree with the opinion that Web environments supporting asynchronous access are and will continue to be in much broader use in education than situations that involve real-time communication [8]. But it must be stressed that face-to-face contact between the instructor and the student, as well as between the students, are still not-to-be neglected instructional activities, even when the Web is extensively used [7]. Web-based course materials can be exploited to prime students for classroom lectures or laboratory practice, or even to make classroom time available for alternative learning activities.

Care should also be taken not to overwhelm students with on-line information, because excessive postings distract students from the focus of a lesson and decrease its impact. This has a negative effect on student morale, focus and learning. A small concise lesson is much more effective than a large encyclopedic lesson. Breadth and depth can be provided during classroom discussion and presentations. Moreover, it must be noted that the technology can intimidate students who are less computer literate. It is important to make sure that these students do not fall through the cracks and to get them comfortable with the course software and the Internet as quickly as possible [15]. Thus, the gradual integration of the Web and the Internet, in general, into the conventional courses brings forward the students to familiarize themselves with the use of this valuable tool.

There are several ways to produce such kind of environment. Several commercially available software tools make it easier to design, run and manage web courses. Although most require a little knowledge of hypertext markup language, not much programming or other technical experience is needed.

Typically, web course platforms permit students to log on securely using a standard browser. In most cases, they include a database-centered syllabus with links to internal or external Web pages; on time-monitored testing; discussion groups; and e-mail.
Among the most popular e-learning packages are:

- Blackboard Learning System http://www.blackboard.com) is an on-line course management system that uses templates.
- Lotus Learning Space (http://www.lotus.com/home.nsf.welcome/learnspace) is primarily targeted at corporate users.
- WebCT (http://webct.com) is a low-cost, asynchronous course delivery and management system developed at the University of British Columbia, Vancouver, B.C. Canada, and now sold through Universal Technology, Peabody, Mass.
- Topclass by WBT Sustems, Waltham, Mass. (http://wbtsystems.com), is the most mature product on the market.

The use of web course packages has many problems. Let us discuss some of these problems:

- Support of greek or other languages. Most of the e-learning packages support only English and some of them french and german. This problem is very important. Some greek sites that offer web courses have employed one of the above-mentioned software packages. Although the courses are in greek language the interface is in english. This is not very convenient especially for students who are not familiar with the English language. Although most students in Greece posses basic understanding of english language, the situation is different as we move on to older student.
- The installation and administration of such a package requires an experienced administrator. Some of them let you create and maintain your web-course on their site.
- Most of these packages require a designer to construct each course.

Although the idea of group working for implementing and using the web course package (administrator, designer, tutor,) appears to promote cooperation, this model is not always suitable. This is obvious especially in the case of small university departments with limited human resources. In this case flexible solutions are required.

3 Blackboard

The focus of educational technology has shifted from improving the efficiency of administration to inspiring pedagogical innovation and improving the learning experience. As the daily lives of students, teachers, and staff become more Web-centric, savvy administrators are applying the lessons they've learned in administrative computing to enhance the way their institutions deliver education—today and well into the future. The Blackboard Learning System has been designed, since its inception, for institutions dedicated to teaching and learning. Blackboard technology and resources power the online, Web-enhanced, or hybrid education programs at more than 2,000 academic institutions. Whether the institution is a research university, community college, high school, or virtual MBA program, the Blackboard Learning System offers a proven solution to meet an institution's needs [16].

The Blackboard Learning System features an award-winning environment for online teaching and learning and is designed to complement traditional instruction or power pure distance learning through the following utilities [16]:

- Content management and content sharing
- Assessment management
- Gradebook and assignment management
- Collaboration and communication

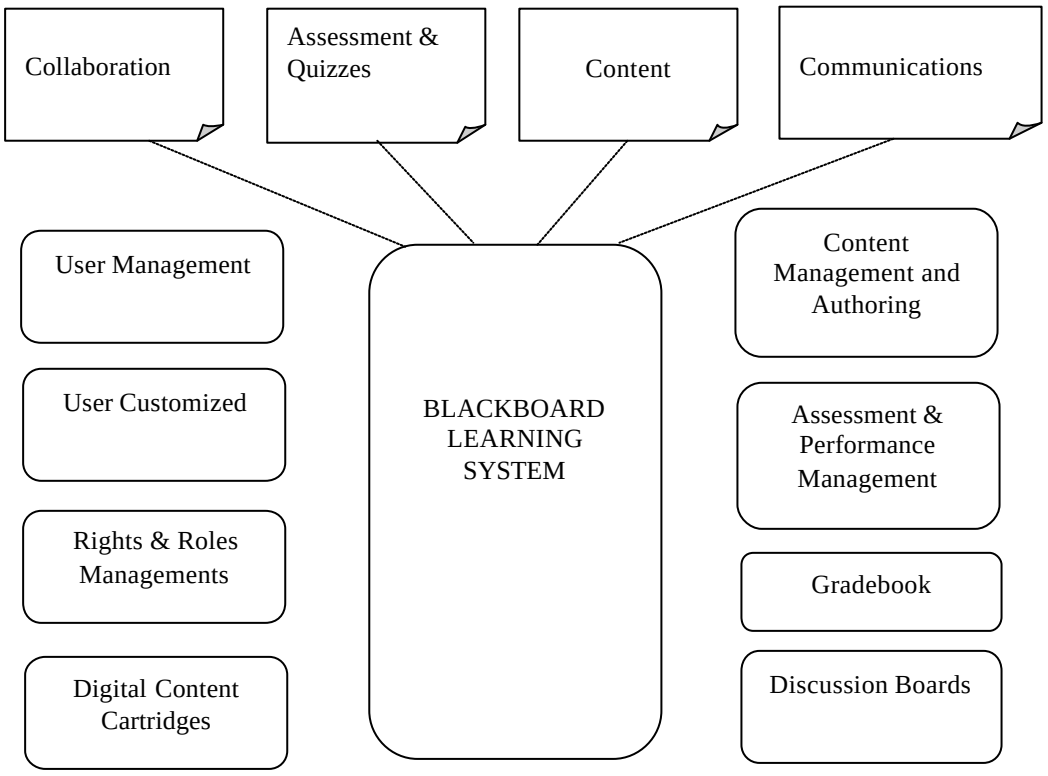

Fig. 1: Parts of the Blackboard Learning System.

- Student and instructor portfolio management

System administrators and decision-makers at organizations running the Blackboard Learning System must continually plan for an ever-increasing number of users, depth of usage, and overall load on their implementation. Through the following enterprise functions and capabilities, the Blackboard Learning System provides a flexible environment for system administration that greatly facilitates success planning and management [16]:

- Data management for student information, identity management and authentication systems
- System management utilities
- Standards, policies, and management for online courses
- Branding, system configuration and design
- Communications and calendaring functions

The Blackboard Learning System has been architected to deliver a responsive, highly scalable system that allows for minimal downtime and, when necessary, speedy and systematic recoveries. Designed to support a wide array of configurations, ranging from a single server to a farm of application and database servers, the Blackboard Learning System features a modular architecture that can meet a diverse set of deployment and configuration parameters.

4 Environment description

The main sections of the web site are depicted in Fig.2 and their contents are described in the following. The first page that each user access when entering the course-support environment is the course announcements; in reverse chronological order, i.e. the most recent one resides on the top of the page (Fig.3). We must note that the navigation buttons are still in english but Blackboard Inc and the university of Thessaloniki are working together in translating the course support environment.

Course Information: This section provides an overview of the course objectives and a brief listing of the course contents. It also includes information concerning the course grading rules and also the dates of the course during the semester.

Staff Information: It contains the name of the course instructor along with the telephone number, the e-mail address, and the location of his office.

Course Documents: This is the main section of the course support environment. It includes the course syllabus in a weekly basis, along with various documents (PowerPoint presentations, PDF, etc) that are used in the course. There are also links in quizzes for the evaluation of the students. Each week the students can access the documents of the current and past courses (Fig.4).

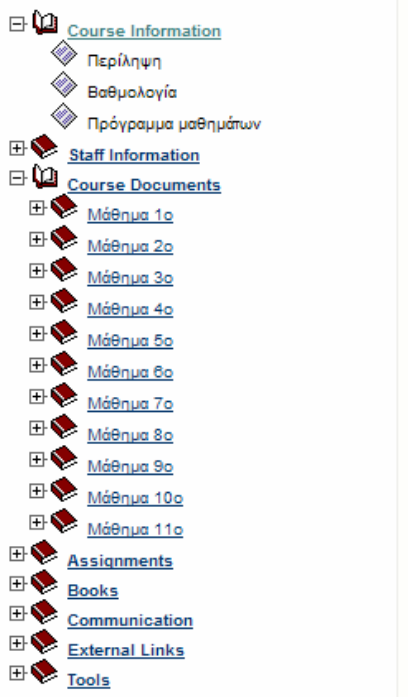

Fig. 2: Course map.

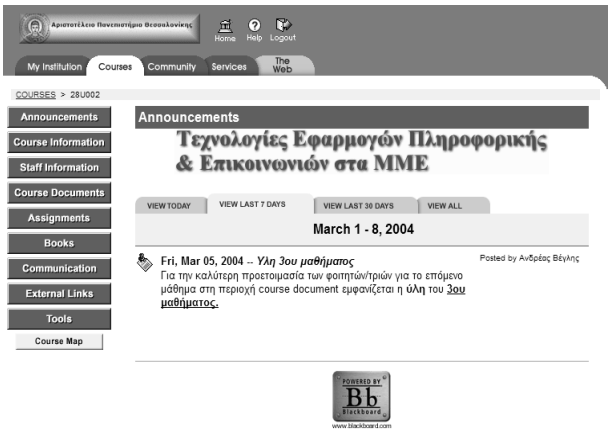

Fig.3: Announcements.

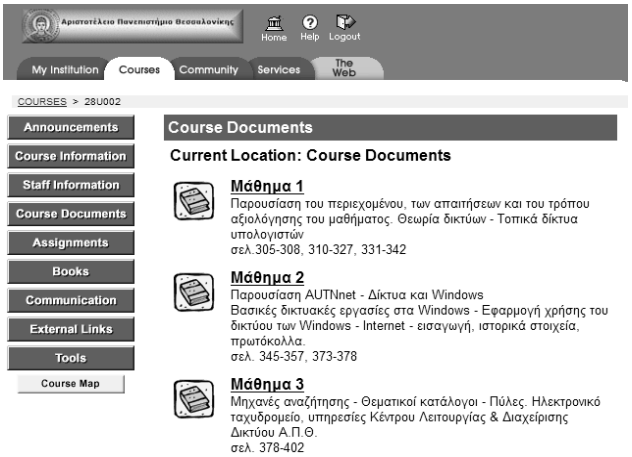

Fig. 4: Course Documents.

Assignments: This section includes assignments that the students have to complete during the semester. Students complete their assignments and deliver them in the digital dropbox of the instructor, accessible through the tools area.

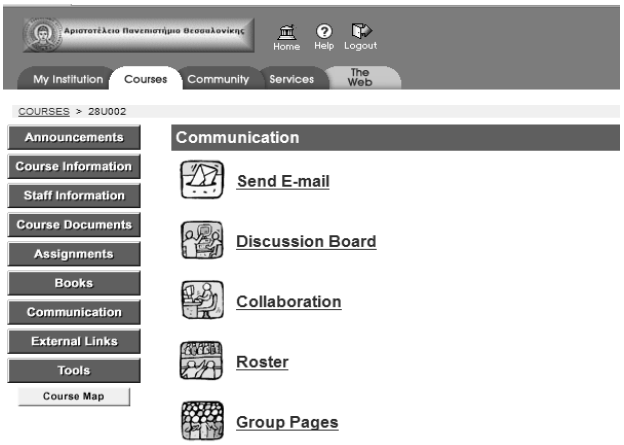

Fig.5: Communication Tools

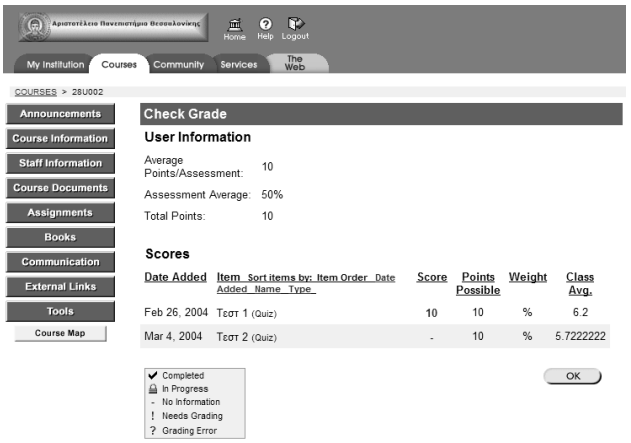

Fig. 6: Student's gradebook.

Books: This section includes a full listing of the proposed bibliography, comprising of Greek and mainly international book editions.

Communication: This section facilitates various communication tools such as e-mail, discussion Board, Collaboration, etc. with which students can communicate with the instructor and with other students (Fig.5).

External links: This section facilitates the student's access to supplementary on-line material, through links to various international web sites.

Tools: This section provides a list of available tools such as Calendar, gradebook (Fig.6), manual, digital dropbox, address Book, etc.

5 Evaluation

Following the development and use of the course support environment, a formative evaluation was conducted. The aim of this formative evaluation was to assess the students' attitude towards the blackboard course support environment. Students, that had just completed an elective course on internet search, in January 2004, were asked to supply feedback about the effectiveness of the course-support environment, by expressing anonymously their opinion. A total of 42 questionnaires were returned.

Initially students were asked to rate their computer knowledge. A high percentage of 86% claim to have very good or good computer knowledge. Only 7% of the responders believe that their computer knowledge is insufficient. The majority (86.5%) of the students report that they have access to a computer with Internet connection. The rest of them own a computer but without an internet connection. Surprisingly all students admit that they own a personal computer. Based on the above it is obvious that the majority of the students have enough knowledge and the appropriate hardware to fully exploit the potentials of a course support environment. Of course we must note that all students have attended four courses related to information technology in the previous semesters and posses a substantial computer experience.

Next we investigated the students' attitude towards the blackboard environment. All the students admit a positive attitude towards the blackboard environment. 36% of the students report no navigating problems in the course support environment, and 64% admit to have some difficulty. The easy adoption in the Blackboard environment can be easily explained by the fact that the majority of the students can be characterized as heavy internet users.

Next we investigated the effects that the use of the course support environment had on the course. 50% of the students believe that the use of the Blackboard environment made the course more attractive, 36% say that it made the course easier and 14% does not find any effect on the course. All students welcome the introduction of the course support environment to all the courses that are taught in the department of Journalism & Mass Communication. Currently we are in the face of developing course support environments for the majority of the courses that are being taught in the department of Journalism & MC.

Following the above we investigated the use (not during the course) of the course support environment by the students. 21% of the responders stated that they used the environment many times, 21% two-three times, 29% only once and 29% never.

Table 1

	Many times	2-3 times	Once	Never
Course Information	7%	50%	21%	21%
Course document	64%	14%	21%	0%
Books	7%	0%	14%	79%
Quiz	71%	29%	0%	0%

Finally we studied the use of the environments' sections by the students. Table 1 summarizes our findings. Course documents and quizzes were the most popular sections with course information and books receiving far less attention. That was expected since quizzes were obligatory and offered students a chance to improve their grades, and course documents contain all the documents used during the teaching process. It is obvious that we must motivate our students to use more often the course support environment.

6 Conclusion and future work

The web-based environment that was designed and implemented for the support of the internet search courses has been proved an invaluable tool for the students. The results from the overall process were very encouraging. The students seem to be able to cope well with the integration of the Web as a tool to enhance traditional classroom lectures, and also encourage the adoption of similar course support environment in all the courses they attend. Its gradual integration into the teaching and learning procedure makes its adoption from both sides – instructors and students – a natural consequence of the information age we all experience, and has already attracted some useful suggestions for its future improvements. Also the majority of the students can access the course support environment via dialup connection, and that offers us the possibility to offer distance learning courses in the near future. Future extensions of this effort will be the further exploitation of the possibilities offered by the Blackboard Learning System, namely the communication tools that allow the synchronous interaction between students and instructors.

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