Adding content in Course Support Environments

ANDREAS VEGLIS[1], ANDREAS POMPORTSIS[2]
[1]Media Informatics Lab. Dept of Journalism & MC
[2]Dept of Informatics
Aristotle University of Thessaloniki, 54006 Thessaloniki
GREECE
http://pacific.jour.auth.gr/veglis

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. But we must not forget that Course Support Environment is still the tool through which we want to support the educational process. Little attention has been focused on the possible content of a Course Support Environment. This paper studies the types of material and the ways that this material can be embedded in a course support Environment. We examine three different Course Support Environments. One of them is a commercial product and the other two are Open Source Software.

Key-Words: - Course Support Environment, content, comparison

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]. It is worth mentioning that many researchers use the term virtual learning environments, as an umbrella term that covers different kinds of learning systems.

Very important role in the successful introduction of a Course Support Environment plays its content. Various files (text, HTML, media) and other material can be uploaded. The content, its organization and the way it is presented in the student are very important. Also various factors concerning the students that they are supposed to access the content must be taken into account (computer knowledge, capabilities of their computer, the applications that are installed in their computers, the type of connection to the Internet, etc.)

This paper studies the types of material and the ways that this material can be embedded in a Course Support Environment. The study is focused on the three Course Support Environment Platforms currently employed by the Greek Universities. The rest of the paper is organized as follows: The situation in the Greek Universities as far as Course Support Environments are concerned, is discussed in Section 2. The three platforms (Blackboard Learning System, Moodle and Claroline) are briefly presented in Section 3. The types of material and the ways that this material can be embedded in the three platforms is studied in Section 4. Concluding

remarks and future extension of this work can be found in Section 5.

2   Greek Universities

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 [11]. 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 environments. Results of our effort were published in several papers [12-15]. But of course this solution had many limitations. Two years ago the Aristotle University of Thessaloniki has purchased and installed the 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 (https://blackboard.lib.auth.gr). The Blackboard platform has been in use in the Aristotle University of Thessaloniki since 2003. Currently the platform includes 163 courses but only 53 of them are active. 91 professors are using the system and 1112 students are active users. The system accepts approximately 1414 hits per day.

Other greek universities and educational networks have implemented different approaches. They have adopted Open Source Software and customized them to meet their demands. More precisely the Greek University Network (http://www.gunet.gr) has developed E-class (http://eclass.gunet.gr) that is based on Claroline (http://www.claroline.net). This platform was adopted by many greek universities, for example the University of Patras (http://www.upatras.gr) which developed an e-class site (http://eclass.upatras.gr/), and also the University of Macedonia (http://www.uom.gr) which developed Compus (http://compus.uom.gr). Compus today includes more than 200 courses and 2000 students. One of the departments of the National Technical University of Athens (http://www.ntua.gr) chose Moodle (http://www.moodle.org) for the development of its course support environment (http://galois.medialab .ntua.gr/ecourses/).

3   The Platforms

3.1 Blackboard Learning System

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 (www.blackboard.com) [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,
➢ 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.

3.2 Moodle

Moodle is a Course Management System (CMS) - a software package designed to help educators create quality online courses. The software is used all over the world by universities, schools, companies and independent teachers. One of the main advantages of Moodle over other systems is a strong grounding in social constructionist pedagogy (Moodle official site).

The word Moodle was originally an acronym for Modular Object-Oriented Dynamic Learning Environment, which is mostly useful to programmers and education theorists. It's also a verb that describes the process of lazily meandering through something, doing things as it occurs to you to do them, an enjoyable tinkering that often leads to insight and creativity. As such it applies both to the way Moodle was developed, and to the way a student or teacher might approach studying or teaching an online course.

Moodle is Open Source Software, which means you are free to download it, use it, modify it and even distribute it (under the terms of the GNU General Public License). Moodle runs without modification on Unix, Linux, Windows, Mac OS X, Netware and any other system that supports PHP, including most webhost providers. Data is stored in a single database: MySQL and PostgreSQL are best supported, but it can also be used with Oracle, Access, Interbase, ODBC and others. Moodle has 50 language packs, including: Arabic, Catalan, Chinese (simplified and traditional), Czech, Danish, Dutch, English (UK and US versions), Finnish, French (France and Canada versions), German, Greek, Hungarian, Indonesian, Italian, Japanese, Maori, Norwegian, Polish, Portuguese (Portugal and Brazil), Romanian, Russian, Slovak, Spanish, Swedish, Thai and Turkish. Currently there are 2596 sites from 109 countries who have registered.

An important feature of the Moodle project is the moodle.org web site (http://www.moodle.org), which provides a central point for information, discussion and collaboration among Moodle users, who include system administrators, teachers, researchers, instructional designers and of course, developers. In 2003, the company moodle.com was launched to provide additional commercial support for those who need it, as well as managed hosting, consulting and other services.

3.3 Claroline

Claroline is an Open Source software based on PHP/MySQL. It's a collaborative learning environment allowing teachers or education institutions to create and administer courses through the web. The system provides group management, forums, document repositories, calendar, chat, assignment areas, links, user profile administration on a single and highly integrated package. Claroline is translated in 28 languages and used by hundreds of institutions around world (Claroline official site).

The software was initially started by the University of Louvain (Belgium) and released under Open Source license (GPL). A community of developers around the world has since contributed to its development. Downloading and using Claroline is completely free of charge.

Claroline has been developed by an international network of teachers and developers scattered around the world. It recycles entire programs or pieces of code found in the vast library of the GPL Open Source internet mediated community. Today 370 organizations are using Claroline from 57 countries around the world (Claroline official site).

4   The Content

4.1   General consideration

World Wide Web pages differ from books and other documents in one crucial respect: hypertext links allow users to directly access different Web pages. Most information on the WWW is gathered in short reference documents that are intended to be read non-sequentially. This is particularly true for technical or administrative web-sites. Long before the WWW was invented, technical writers discovered that readers appreciate small pieces of information that can be located and scanned quickly [19]. This method for presenting information works well with students for several reasons :

- ➢ Few students are willing to spend time reading long passages of text on-screen. Most students prefer to either save long documents locally or print them.
- ➢ Discrete pieces of information lend themselves to Web links. The student of a Web link usually expects to find a specific unit of relevant information, not a book chapter. Of course we must not overly subdivide the information or we will frustrate our students. One to two pages (as printed) of educational material is about the maximum size for a discrete piece of information on the Course Support Environment.

> Chunking can help organize and present course material in a uniform format. This allows students not only to apply past experience with the Course Support Environment to future searches and explorations but also to predict how an unfamiliar section of the Environment will be organized.

> Concise pieces of information are better suited to the computer screen, which provides a limited view of long documents. Long Web pages tend to disorient readers; they require users to scroll long distances and to remember what is off-screen.

The concept of a piece of information must be flexible and consistent with common sense, logical organization, and convenience. Sometimes it makes sense to provide long documents as a subdivided and linked set of Web pages. Although short Web documents are usually preferable, it often makes little sense to divide a long document arbitrarily, particularly if we want students to be able to print easily or save the entire document in one step [18,19].

4.2 Text

All three platforms (Blackboard, E-Class, Moodle) support the creation of text or HTML files. Moodle and E-Class offer the use of simple HTML editors and Blackboard supports *smart text*. Smart text is text that recognize all major HTML tags but differs is some ways from plain HTML. For example it recognizes the ENTER key as a paragraph tag. Of course we can always create our HTML code in another application and then paste it in the HTML box in the Course Support Environment. Avoid inserting too complicated HTML code because this might create some problems when the platform will try to interpret it .

Except HTML files other kind of files may be used to offer educational material in a Course Support Environment. PDF format is a very popular format. PDF are highly compressed, completely portable and platform-independent. They are recommended for giving the students extended or supplemental material.

Some instructors usually include Word files in a Course Support Environment. If these files are supposed to be accessed online, this may not be a good idea. The operating system of the student's computer, automatically loads the Word application and this might result in the degration of its performance or may disorientate the student. All three platforms can handle the above file formats.

4.3 Multimedia files

Depending on what we want to accomplish there is a big variety of types of multimedia files we can include in the Course Support Environment. Starting from the static graphics files we can use GIF of JPG format. These formats are best suited for the WWW and they do not require special plug-in, in order to be visible.

Video and audio files are also an option, although we must use them only when it is absolutely necessary (especially in the case of the video file), due to their extended size. The format may vary, but Windows Media Player seems to be able to play the majority of them. Of course the download time is a crucial parameter, when deciding if to include long movies in the educational material.

Flash animation is another tool when we require exhibiting to our students a certain procedure. All the latest versions of the browsers play the Flash animations without the need of a plug-in. But always have in mind that we only use animation if it is absolutely necessary for the educational procedure and not in order to make our Course Support Environment more attractive to our students. Some instructors are tempted to supply course material in Flash animations with navigation buttons and internal hyperlinks. Although this solution may be suitable to some rare situations, it is not recommended for general because the material is not printable and we can not guarantee the same appearance of the Flash animation on the student's computer screen. Of course Flash animations may be used to create quizzes and self-assessment exercises that can further enrich the educational procedure.

Table I

	BlackBoard	Moodle	E-Class
Plain text	✓	✓	✓
HTML	✓	✓	✓
HTML editor		✓	✓
Create a link to a graphics file	✓	✓	✓
Display media file within the file	✓	✓	✓
HTML with the graphics embedded in the text	✓	✓	✓

4.4 Text and multimedia files

The existence of the multimedia files is not by itself guarantees the support of the educational procedure. Very important role plays the way that the multimedia files are embedded with the text. Students and generally WWW surfers prefer mixed text and graphics HTML files [17-18]. We must

always try to offer all the necessary data with the minimum number of steps. Table I summarizes the ways the three Course Support Environments support embedding multimedia files with text.

From the Table I it is obvious that all platforms offer similar capabilities. Only Blackboard does not offer a build-in HTML editor but this is not a significant problem since we can always download many freeware reliable HTML editors from the WWW. From our experience in using all three platforms Blackboard seems to be more user friendly and usually offers two ways in creating / uploading content, basic (where only the basic parameters are visible) and advanced (where we can make a lot of modifications).

4.5 Organizing the content

Web sites are usually built around basic structural themes. These fundamental architectures govern the navigational interface of the Web site and mold the user's mental models of how the information is organized. The simplest way to organize information is to place it in a sequence. Sequential ordering may be chronological, a logical series of topics progressing from the general to the specific, or alphabetical, as in indexes, encyclopaedias, and glossaries. Straight sequences are the most appropriate organization for educational sites, for example, in which the student is expected to go through a fixed set of material and the only links are those that support the linear navigation path [19].
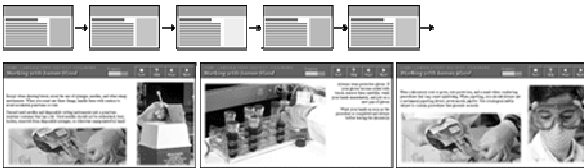

Fig 1: Linear navigational path.

One variation of the previous mentioned organization may include a logical sequence, but each page in the main sequence may have links to one or more pages of digressions, parenthetical information, or information on other Web sites.
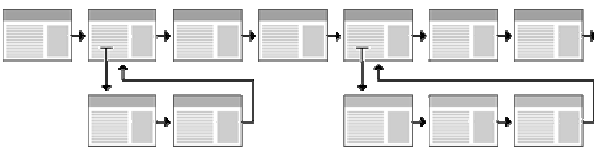

Fig 2: Linear navigational path with additional web-pages.

Information hierarchies are the best way to organize most complex bodies of information. Because Web sites are usually organized around a single home page, hierarchical schemes are particularly suited to Web site organization. Hierarchical diagrams are very familiar in corporate and institutional life, so most users find this structure easy to understand. A hierarchical organization also imposes a useful discipline on your own analytical approach to your content, because hierarchies are practical only with well-organized material [19-20].
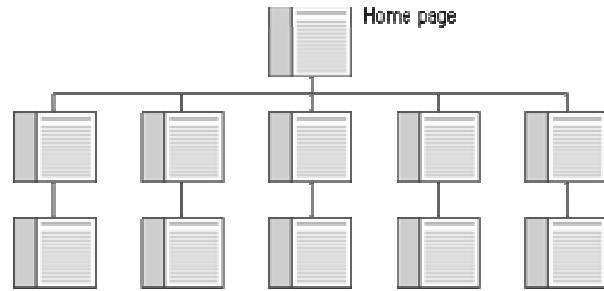

Fig 3: Hierarchical scheme in a web-site.

The problem is what kind of organization we can create in a Course Support Environment. All three platforms offer about the same capabilities. We can create a lesson or a series of courses that students can access sequentially (based on chronological order) or directly (a student may be interested only for a particular course). In each course we can organize our material in folders in the same way as in the local disk. The problem is that we can not make hyperlinks from one file to another. Thus the students can access the content only by following the organization of the site, based on the navigational structure that the Course Support Environment offers. Simple text descriptions should be added at the entrance of each folder in order to inform the student about the content of the folder. Thus the student can have a general idea of the content of each folder without needing to browse them. Another helpful tip is to use the same organization of the educational material in all courses.

5   Conclusions

This paper has focused on the content that can be included in a Course Support Environment. More precisely we have discussed the format, the type, the organization and the integration of multimedia files with HTML files. The university community in Greece seems to follow different approaches in implementing Course Support Environments for its courses. Commercial software and Open Source Software for Course Support Environment have been briefly presented and compared. Based on the findings we can conclude that there are no

significant differences of what the three platforms offer. One thing is certain Course Support Environments limit the way instructors can organize the educational material. It is time for the developers to give the instructor more tools, to unable them to use all the characteristics the WWW offers in the educational process.

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