The Web-Enhanced Classroom

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Introduction

Teaching and learning via the Internet is one of the most discussed delivery methods for distance education today. Wheeler and Jarboe (2001) state that a combination of online and traditional classroom instruction has become the most popular way to use Internet teaching and learning tools. The combination of online activities with traditional classroom instruction is commonly referred to as web-enhancement. Goldberg (1997) and Wheeler and Jarboe (2001) found that students with access to both traditional lectures and an online environment fair better academically than students instructed either entirely in the traditional classroom or entirely via the Internet. Web-enhancement incorporates the best of two worlds; efficiency of student administration and an enjoyable, flexible learning environment that embraces the diversity of student learning styles (Khan, B. 2000).

This paper addresses four fundamental components to successfully web-enhance a course: Administration, Assessment, Content and Community. Each component can be incorporated into a course to enhance student learning in a variety of ways. A teacher can choose to address any one, several or all four components in the process of web-enhancing a course.

In addition to the four components of web-enhancement, this paper will discuss web tools that can be used to meet the technical requirements of each of the four components. Although the list of web technologies and providers could be extended due to continuously emerging new and modified Internet teaching and learning tools, this paper will present examples of how each of the four components can be implemented based on technology provided by Blackboard, eCollege, Mallard, PageOut, WebBoard, and WebCT (Table1).

The Four Components

A first step to including the Internet to achieve learning outcomes is to address the question to what degree the course should be web-enhanced. At this point the teacher makes decisions on what online learning activities best contribute to student learning; and what framework best addresses pedagogical and technological issues such as student learning styles and course interface design (Khan, B. 2000). Once these decisions are made, the teacher can start to create an Internet entry point for the course. This entry point is commonly referred to as the *Course Homepage*.

The Administrative Component

The *Course Homepage* is the first step towards constructing the 'Administrative Component' of a web-enhanced course. The Administrative Component lays the foundation for the organization and administration of the web-enhanced course. Tools of the administrative component are designed to increase teacher productivity and efficiency. A well-developed administrative component allows a teacher to spend more class time interacting creatively with students and addressing higher level thinking skills rather than on mundane activities such as distributing materials or collecting assignments. For example, a teacher can provide a link to a location on the course website where students can download new or upload completed assignments so no class time needs to be spent on distributing or collecting those assignments. Deadlines can be established so late assignments cannot be turned in or only with penalties, depending on grading policies. These grading policies can be clearly outlined in the

course syllabus that could also be posted to the website. Students can access the syllabus anytime instead of discussing grading policies during class time, or, if need be, the teacher can refer students to the appropriate website.

Additional efficiency can be obtained by using an online grade book. Once graded, statistics for assignments (curve, mean, standard deviation) can be posted to the online grade book. Students do always know where they are with their academic performance, even if they do not keep their own records.

Yet other administrative tools allow teachers to track student progress. These tools can be used to check when and how often a student has accessed the course website and how often a student posted messages to the discussion tools (Goldberg, 1997). Progress tracking tools are particularly useful when most of the course is taught over the Internet and attendance in the traditional classroom is replaced by 'virtual attendance'. Tracking student progress is also the basis for student assessment and the Assessment Component.

Administrative Component Tools

With a good command of the hypertext markup language and an understanding of software packages such as Dreamweaver or Microsoft FrontPage, a teacher can easily construct the course homepage and create hyperlinks to course sites such as

newly posted assignments. However, a course homepage can also be created without learning html code or how to use new software packages. Existing e-learning providers such as WebCT, Blackboard, or PageOut make Internet teaching and learning tools available that help to quickly create a course website by modifying predefined course website designs and templates.

In WebCT, for example, a teacher can use the *Designer Options View* of the predefined website design in order to construct and organize the course without any knowledge of html or any web-development packages. The teacher simply adds the predefined tools that should be available for the particular course. For example, if the teacher decides to use the assignment tool, all he or she needs to do is to add the assignment tool icon to the course homepage and link appropriate assignments to the icon. Students click on the icon to read the assignment and upload the finished assignment to the course website. Deadlines can be set so late assignments cannot be uploaded.

PageOut provides course management tools similar to those of WebCT, including pre-defined website designs and templates to quickly and easily publish a course online. However, the major advantage of PageOut is it's hosting service. This saves an educational institution from purchasing expensive software and hardware.

Blackboard also provides software solutions that help manage online

academic environments. Blackboard's Course & Portal Solutions for example, provides online course management, academic communities and administrative services.

The Assessment Component

The Assessment Component addresses how student performance and learning can be assessed via the Internet. One great advantage of assessing student learning via the Internet is the ability to provide instant feedback to the student. For example, online quizzes can be set up so that students can receive an explanation as of how or why a certain question was answered incorrectly. This immediate feedback reinforces learning. Furthermore, online testing makes it easy to provide repeated testing opportunities for practice purposes, which helps students to learn the subject matter more thoroughly. With the use of the Internet, a teacher can facilitate a random selection of test questions each time a student wants to retake a quiz for practice purposes on the same subject matter.

Assessment Component Tools

In the process of web-enhancing a course, the teacher decides if all assessment should occur over the Internet (e.g., online quizzes) or if some assessment would be done better in a traditional environment (e.g., classroom presentations). Multiple choice, true/false and short answer items can be

Table1: Web Teaching and Learning Tool Providers

	Provider	Strength	website
Blackboard	Blackboard	Content	http://www.blackboard.com
Mallard	University of Illinois	Testing	http://www.cen.uiuc.edu/Mallard/
PageOut	MacGraw-Hill	Site Hosting Service	http://www.pageout.net/
WebBoard	ChatSpace	Electronic Community	http://www.webboard.com
WebCT	WebCT	Comprehensiveness	http://www.webct.com
eCollege	eCollege	Site Hosting	http://www.ecollege.com

easily administered via the Internet. Once a question has been developed and added to an online database, it can be pulled from the database and added to a new online quiz. Questions can be used until they are deleted from or modified in the database. The grades for an online quiz can be posted to the electronic grade book and immediately display the results to both student and teacher. In addition, the online quiz can be designed so students can take it from any location with Internet access; or, if the instructor does not like this option, student access can be limited to computers in a local computer laboratory. Both WebCT and Mallard provide excellent Assessment and Quiz Tools!

Mallard provides further enhancement of testing tools by creating student logs that enable teachers to observe student progress on an assignment even before the due date. The instructor can establish grading policies that are more specific than those created in WebCT. E.g. a quiz could allow up to 15 submissions, require a minimum passing score of 60%, and have a late penalty of -15% a day for 3 days. Homework in the same course might have a yet different grading policy, and practice exercises could be pass/fail. Since quizzes are submitted and graded on-line, the instructor does not have to collect, correct, or even record grades. Questions for the quiz can be either randomly generated (if appropriate) or randomly selected. Therefore, different students can be given different quizzes and the same student can see a different quiz each time she or he retakes it. Course evaluation and research data can also be collected online. WebCT includes a survey tool to assess student input about specific issues anonymously. Numerous research studies have used this tool to gather student information about issues such as the quality of the web-enhanced course, or the efficiency with which the Internet teaching and learning tools were applied (Freeman, 2001).

The Content Delivery Component

The Content Delivery Component focuses on the communication of course content and online learning activities. Teachers may integrate the online content delivery component to varying degrees. Although the traditional classroom instruction should not be considered a direct competition to a 'virtual' classroom environment, a significant amount of learning can take place outside the traditional classroom if students have access to subject matter online and study the material at their own pace.

As in traditional instructional environment, student learning is strongly impacted by the teacher's ability to communicate the subject matter. Creating a successful learning environment therefore heavily depends on the creativity of the teacher. When communicating content via the Internet, it becomes increasingly important that the teacher is aware of the learning styles of his or her students and incorporates instruction aimed at supporting a broader array of learning styles. Multiple combinations of learning activities, learning strategies and media usages can be developed in order to best meet diverse student learning styles (Saba, F. 1999). Furthermore, it is important to decide which subject matter can be taught most effectively via the Internet and which can be done more effectively in the traditional classroom. Certainly, in many cases course content can be communicated effectively using either traditional classroom instruction or the Internet. However, Ryan, Carlton, and Nagia (1999) found that students enjoy using the Internet for the structured presentation of course material and prefer traditional class time to be used for informal interaction and the development of advanced level thinking skills.

Furthermore, the Internet provides access to resources that go beyond what a teacher can incorporate in a course during regular class time. Students learn how to research information on the Internet and become more 'independent' in their acquisition of knowledge. For example, students can access books and literature online or access content material related to their subject matter, offered by teachers other than their own from the same or related disciplines.

Content Delivery Tools

In addition to uploading content material such as audio and video enhanced presentations and study guides to a Files Database, WebCT includes content material by establishing links to sites shared by teachers and other professionals in the same field. This feature gives students a second perspective. Linking to courses other teachers have put on the Internet is becoming increasingly popular among WebCT users. The WebCT virtual community enables teachers and students to share materials, experiences, content reviews and ideas on almost any academic discipline.

Students can visit or download these content files at any time. This leads to one great advantage of web-enhanced instruction: Students that are self motivated are not confined to classroom instruction and thus enjoy a tremendous amount of flexibility. In addition, students become more independent and more actively involved in the learning process. This is particularly true since online resources can be used to supplement lectures. Freeman (1998) found that students enrolled in web-enhanced courses have access to many sources otherwise not accessible in a traditional classroom setting.

A second way to add online content to a course is to include WebCT's *Content Showcase*. The WebCT Content Showcase provides access to online course materials developed by WebCT Publishing Partners. Currently there are over 20 publishers that develop customizable online course materials, such as video animations, sample syllabi, lecture notes, quiz and test banks, and glossaries based on their textbooks. The instructor simply needs to choose which chapters of a textbook to include and thus does not have to create a course from scratch. Once the choice is made, students purchase an access code and use the showcase materials. Other providers such as PageOut integrate a teacher's existing course content with online course content provided by McGraw-Hill or

other publications. Providers such as eCollege partner with leading textbook and new media publishers to provide educators and students with content resources. Incorporating material from the so-called 'Content Partners' enables educators to quickly create new courses or add new elements to existing courses. Some of eCollege content partners include: Cogito Learning Media, Inc., Harvard Business School Publishing , Pearson Education , and Delmar.

The Community Component

Seabolt and Arends (2000) indicate that the success of an online course often depends on the quality of the established learning community. The Community Component addresses the sense of community among students and between teachers and students. However, the use of the Internet to create an online community is no longer limited to just a teacher and his or her students. Rather, an entire Academic and Educational online Community has emerged can be included in the learning process.

Although community tools are straightforward in their application, it can be challenging to coordinate their use. Creating a successful online community depends heavily on how the teacher promotes the learning community. For example, an online community can be created through initial bonding activities, synchronous chat or communication sessions, or monitoring and supporting continued interaction and participation of both teachers and students. In addition, the online community should be maintained via multiple means of communication and encourage both work and social interaction publicly and privately (A Learning Community, 2000). However, successful online communication will depend on clearly established expectations and parameters of communication, such as attending regular office hours in cyberspace, participating in online chat sessions, or regularly posting questions or answers to online discussion forums.

A combination of online and offline communication adds to the flavor of a course. Some traditional class periods may be replaced using web communication tools, or office hours can be held both in a virtual and in a traditional setting. If the course is designed that all communication occurs exclusively via the Internet, it is imperative to provide means of communication that enable student-student and teacher-student interaction.

Community Component Tools

Peters, Nutter, and Toto (2000) suggest that the key to successful online community is that teachers create good questions and case studies. Online communities can be established by including communication tools that are categorized as either synchronous or asynchronous tools. The most common tool to communicate synchronously is the chat tool. Once a time is set up for the synchronous chat session, students and their teacher logon to the website and start to 'chat' in real time. The chat will be a positive learning experience if both teacher and students are prepared. Students should read the lesson for the day prior to attending the chat and the teacher will have prepared some meaningful questions to ask while in the chat room. Students will also be encouraged to ask questions about the subject matter. If neither the teacher nor any of the participating students know the answer, teacher and students can offer to research the answer and bring it up in the next chat session, or post the answer asynchronously to a discussion forum. One disadvantage of chat rooms might be that the level and depth of communication often depends on the participants writing and typing abilities. These shortcomings can be compensated using web conferencing tools. Web conferencing is a live connection of two or more people using some combination of video, audio and data for the purpose of communication (Wernett, 1997). However, web conferencing tools require web cameras, microphones and Internet videoconferencing software that can make the synchronous online communication experience more costly and require a higher degree of technological competencies for both teachers and students.

Asynchronous communication, namely communication online, but not in real time, enables students and teachers to post messages to a location on the course web site at any given time. Using discussion tools, students can either respond to existing discussion topics or post a new topic. When a student responds to an existing discussion topic, the message will be posted by the particular topic and create a threaded discussion. Students that post new messages start a new threaded discussion.

Blackboard, WebBoard, and WebCT technology provide an excellent environment for both threaded discussion and chat tools. In contrast to the use of the chat and discussion tools within a web-enhanced class, course independent discussions and virtual conferences have become a popular means of communicating among the community of online teachers and learners.

Internet Discussion Groups for Academic or Educational Communities are becoming an increasingly important feature for elearning providers. WebCT's Academic Communities for example, help to identify discipline-specific resources, tools, and public discussion forums. Public forums allow teachers to exchange ideas and practices with other students, teachers and professionals. Topics can include identifying appropriate online tools, sharing helpful online resources or simply sharing personal experiences with online teaching. Discussion Forums can either be self-moderated or moderated by a particular team of professionals. Other providers, such as WebBoard and Blackboard have also been instrumental in developing virtual academic communities. WebBoard in particular has been a successful message board for educational institutions and corporations that are looking to build online communities. WebBoard's discussion tool has been equally successful in virtual classrooms, corporate intranets and online

forums. Additional ways of providing an academic community is suggested by eCollege which has partnered with colleges, universities, K-12 school districts and corporate training organizations to design, build and support online communities.

Summary

Well developed Web-enhancement components increase teacher efficiency and student learning. Finding the right degree of web-enhancement to meet the broad array of learning styles is one of the greatest challenges when implementing Internet teaching and learning tools. Considering the four components when developing a web-enhanced course can help a teacher to facilitate efficient course administration and better student assessment. The four components help to improve the delivery of content, and enhance communication among students and between teacher and students. The effective use of Internet teaching and learning tools saves time and allows more time for students and teachers to explore advanced subject matter and practice higher level thinking skills.

Assessment tools like the quiz tool can be employed to not only administer tests, but also to provide immediate grading and online feedback to students. The online feedback reduces the need for remediation during valuable class time and help teacher and students to spend more time on new or more advanced subject matter.

Finally, if an instructor decides to put a course entirely on the web, understanding the community component and it's the communication tools becomes imperative. Effectively replacing the traditional classroom interaction is one of the greatest challenges in placing an entire course on the Internet. The existing tools, though rather easy to use, do not replace the traditional classroom experience. Although communication tools such as the chat, discussion, and web conferencing tools provide excellent media of communication for students and teachers, new tools are needed to 'catapult' online teaching and learning to a higher level, and ensure communication that consistently equals or even surpass the quality of communication in traditional classroom environments.

Teachers planning to web-enhance a course but who do not thoroughly consider the four components of successful web-enhancement can create frustration for themselves and students and thus lead to premature abandonment of the online learning and teaching experience. Properly applied, the current online teaching and learning tools can help teachers at secondary and post-secondary levels to expose students to a positive, enjoyable learning experience that foster students' understanding of the Internet's increasingly important role in the process of life long learning.

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