Using the Web to Create a Dynamic, Interactive Learning Environment

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ABSTRACT

Use of the Internet to support the delivery of courses is becoming commonplace. However, much of the time technology is used simply to provide an online syllabus for a course, with little added benefit for the student. While there are several full-function tools to help professors deliver online courses, these require a significant commitment to learning these tools. This paper describes the application of various techniques available to professors wishing to augment the delivery of their courses without having to learn one of the full-function tools designed to support online course delivery.

I.   INTRODUCTION

Much has been written recently about the role of the Internet in higher education, primarily about using the Internet for distance education. However, the Web is also an excellent tool to support traditional classroom education. For example, the Web can serve to improve the relevancy of course materials and facilitate student and student-professor interaction outside of the traditional classroom.

However, instructors do not always use the Internet effectively in their courses. While having a course web page is common, it is often only an online version of the printed syllabus. In this paper we assume that the reader has the ability to develop a course web page but is now contemplating ways to use this technology more effectively to better support his or her teaching.

Over time, we have developed techniques and tools that effectively support our teaching goals and pedagogic approaches across a range of courses, from programming courses to case-oriented, writing-intensive courses. Several comprehensive course management tools, such as WebCT, LearningSpace 4.0, and Blackboard 5, are designed to support both distance and traditional courses. However, instructors often prefer to use tools that fit a particular pedagogical task, instead of a "Swiss-army knife" tool that is designed for many tasks (Chizmar and Williams, 1999). While comprehensive tools are useful and can help implement many of the ideas presented here, they often require the instructor to adopt a specific framework or structure. We use smaller, more specific tools and techniques.

This paper describes how we are using these various tools and techniques on the Internet to enhance our "traditional" (i.e., classroom) courses. We emphasize using the Internet to improve our teaching and solve problems in specific areas where we think the technology best applies rather than developing a means for conducting distance education. Secondarily, this paper can serve as a starting point for finding resources to help you develop your own mechanisms for effectively using the Internet in your teaching.

1. Pedagogic Goals

Use of technology for teaching should be tied to the goals for a course. Two pedagogical goals that technology can help meet include:

- Making courses more dynamic
- Allowing more interaction and feedback

II. DYNAMIC COURSES

Two of the most straightforward uses of the Internet are to use it to make the course more dynamic and timely and to encourage active student learning. Three basic requirements are at work here: keeping students up to date on developments in the course, using the vast information resources directly in the course, and providing links to resources for further active learning.

1. Informing Students

Because our courses meet only once or twice a week, we need a way to get information out to students. Two ways of informing students about late-breaking news related to the course are Email and an Announcements web page. Email use is discussed in the Interactivity section below, and it has the advantage of being a "push" technology, by which the information is "pushed" out to the students. Because most students use email regularly, they are likely to get any new information you send them. An announcement page, of course, only works if students check it frequently. On the other hand, it has the advantage of being accessible even if the students do not have an email address.

2. Timely, Relevant Course Content

While many of the fundamental principles that we teach in our courses do not drastically change in a short period of time, new applications of those principles and new concepts are being developed continually. Links to online articles from both the practitioner and academic press can be added easily to the reading list to supplement textbook readings. Because the instructor does not have to get copyright permission to make photocopies, these online articles can be added on very short notice. Students enjoy reading current articles, particularly in a practitioner's periodical, that describe the application of concepts they've been learning about. At least one recent survey showed that students found online materials more interesting (Draude and Brace, 1999).

Many subscription-based periodicals exist in free online versions of their publications (although online publication is sometimes delayed for a week or two). By finding the online versions of your favorite publications, you can easily provide students with access to recent articles you may have read without making photocopies of the article. In addition, most online publications include search engines that will provide access to archived articles going back several years.

Directly linking to such material from an online course schedule is a good way to make new information available to the students. Students can quickly link to and read the article online or print it out for later reading. In several cases, we have taught an entire course based on online readings, and the students found the articles more interesting to read than a typical textbook. We organized the readings around the topics of the course and used class time to develop integrative frameworks for the articles. In some cases, students found more informative articles than those that we had chosen and we were able to include the new material as required reading on very short notice.

In addition to the periodicals, other vast online resources address just about any business topic. These include government sites, lists of links compiled by individuals and organizations, and white papers written by for-profit companies. Of course, many university libraries also have web accessible search

engines that can provide full-text articles. For a list of some of these sites, see the "Links" section below.

3. Encouraging Active Learning

A benefit of using Internet links to readings related to course content is that students become accustomed to using the Internet as a source of educational material. Many online readings have links to other Internet resources. As stated by Shaw and Polovina (1999),

> …the nature of printed material dictates that references to other material cannot be followed up instantly; there has to be an effort on the part of the reader to seek and retrieve the other resources. By providing seamless links to the material online, however, the reader is able to maintain attention on the subject content itself rather than the task of retrieving it, leading to vastly improved learning.

While making students follow their interests and learn more from the links available to them is difficult, sometimes they do so. Students email us links to resources they have found informative during their independent online learning, evidence that they did not stop learning when they finished the required online readings. Such self-directed, active learning will likely help the students in their long-term careers.

III. INTERACTIVITY

Perhaps one of the most important effects of the Internet has been to increase our ability to interact with those whom we are unable to meet face to face. Because many of our students commute to campus, they are not always able to interact with each other through traditional means such as study groups. In addition, because commuting students spend less time on campus, they also do not have the opportunity to see their instructors when they need guidance. But students need to be able to explore the content of the course with each other and even to help each other. Some students learn better in a group setting than they do through formal classroom presentations, and use of the web can increase the amount of interaction among students (Mills and Salloway, 2001).

To provide an environment conducive to those students' learning, some form of interaction is necessary. You can use several mechanisms to increase the interaction in a course, including email, discussion lists/bulletin board systems, computer chat rooms, and even audio chat rooms. In addition, technology can be used to increase the amount of feedback on student papers, which is a more formal means of interaction. These technologies differ, depending on whether they are intended to be used by participants at the same time (synchronously) or at different times (asynchronously). Asynchronous technologies such as email and discussion lists can be used synchronously if users are simultaneously simply sending and receiving messages. However, synchronous technologies such as chat rooms (which cannot be used asynchronously) are typically better suited for real-time communications. Each of these mechanisms is discussed below.

1. Email

As many instructors have found, email is an excellent way to interact with students. Email allows students to ask questions when they arise, not just during class time or during the instructor's office hours. Asking questions via email also forces the student to ask a well-formulated, specific question. Composing such a question may help refine the student's thinking and, therefore, increase learning. Email also allows the instructor to respond to email at his or her convenience. However, our experience reveals that if the instructor does not answer email relatively promptly and regularly students will not use email frequently.

By using distribution lists, the instructor can also provide late-breaking announcements to the students. When students are working on a tough assignment, email distribution lists can be used to answer frequently asked questions by getting the word out to the entire class at the same time. Once students learn that the instructor sometimes provides vital information through this means, they check email often.

2. Discussion Lists

While email makes one-to-one and one-to-many communication possible, it is not a very effective substitute for the many-to-many communication that goes on in the classroom. However, discussions that involve the entire class, or perhaps subsets of the class, are excellent means for getting students to think critically and understand difficult concepts. Discussion lists, sometimes called bulletin board or message board systems, are a form of technology that supports such a type of discussion. Discussion lists are designed to be used asynchronously – that is, students post messages that can be read and responded to by others at a later time.

Discussion lists have some advantages over regular in-class discussions, including:

- Remove time constraints, allowing discussions to continue beyond a normal class period
- Offer students practically unlimited time to compose their messages
- Provide less "threatening" environment for shy students who are unlikely to speak up during class (Starrett, 1997)
- Enable the instructor to judge continually how well students are comprehending the subject matter than simply waiting for a graded event (test or assignment) (Starrett, 1997)

Discussion lists facilitate a well-thought-out discussion that can include all students, not just those willing to speak up in class. The deliberative nature of the discussions also tends to lead to more student critical thinking.

We have found that in those cases where a discussion list works well (and just like in-class discussions, ensuring a good discussion is not always easy), it has the ability to extend class beyond the limits of the class period. In some cases, we have had online discussions that flowed smoothly from an in-class discussion and vice-versa.

One method to increase the benefits of online discussion is to assign one or two students to facilitate the discussion for the upcoming week. If you first model the type of facilitative behavior you are looking for and then coach the students, good-quality discussions can result, while the facilitators get

good practice at critical thinking. Using student facilitators has the additional benefit of keeping the instructor from being the center of the discussion. As with in-class discussions, students will often consider the instructor's comments to be the "final word" and be unlikely to challenge them. On the other hand, they are much more likely to challenge another student, which leads to a much more lively discussion.

3. Chat Rooms

While discussion lists may lend themselves more to deliberative discussions that can run over a period of many days, they sometimes lack some of the spontaneity and spirit of a classroom discussion. Also, they do not work as well for immediately answering students' questions. Chat rooms can be provided so that students can collaborate from different locations on assignments and studying. We originally used them so that the instructor could hold on-line study sessions the night before an examination without driving to campus.

A Chat Room is a common meeting place on the Internet where students can interact with each other. Students visit a "room" and begin typing messages to all the other students in the "room." Chat rooms provide real-time communication between two users via computer. Once a chat has been initiated, either user can enter text by typing on the keyboard and the entered text will appear on the other user's monitor. Such real-time communication requires well-publicized scheduled events to ensure enough people show up.

Individual class chat rooms can be established so that the discussion topics can be restricted to the particular course. Students are able to set up a predetermined time with others to meet and discuss homework assignments or to have an informal study session. The professor can set up a virtual study room prior to an examination so that he or she can conduct a review session. This is especially important if there are many students who commute and prefer not to drive back to campus for a review session. Instructors can participate in the chat session either openly or anonymously. Anonymous participation (by using an alias) can be useful so that students feel comfortable asking what they may fear are "dumb" questions. You should, of course notify students using the chat that you might participate anonymously.

There are free chat room providers available on the Internet, especially at sites that provide site-building tools. Many of these sites allow you to add a customizable chat room to your web page at no charge. See the "Links" section at the end of the paper to find more information.

4. Audio Chat Rooms

The purpose of audio chat rooms is much the same as the chat room discussed above, except that students can speak to one another rather than type their comments. This requires that students have access to a computer with a sound card, speakers, and a microphone. Many students prefer this approach because it relieves them of the burden of typing.

An audio chat room, often referred to as voice chat, provides the same capabilities as the chat rooms described above. Audio chat rooms provide a meeting place on the Internet where students can interact with each other verbally. As with text-only chat rooms, students can use them to collaborate on assignments or to participate in a study session prior to an examination. Again, the professors can

make use of voice chat to conduct study sessions or even to hold virtual office hours if they are unable to make it to campus. While audio conferencing relieves students from the labor of typing, they become rather unwieldy if more than a few students try to participate simultaneously. Just like a telephone conference call (which it is basically), conversational turn taking becomes difficult when the participants cannot see each other.

Some voice chat applications are half-duplex, which means that they can communicate in both directions but only one way at a time. In other cases, the software supports full duplex, but inexpensive sound cards may be capable of half duplex only.

Free voice chat applications are available from a variety of vendors, including Speak Freely, PC Voice Chat, and PalTalk. They cannot be customized extensively. Links to these are found below.

5. Feedback

Another means of making a course more interactive is to increase feedback. This feedback can be provided from the professor to the student or from the student to the professor. Using electronic means to exchange feedback may increase both its quality (e.g., it can be given at the students' or professor's leisure) and quantity (e.g., not limited to class time), therefore, increasing its learning value.

A. Feedback to Students

Technology can facilitate providing constructive feedback on assignments:

- Students turn in electronic versions of their written work, typically by emailing an MS Word file to the instructor (we are currently working on providing the ability to "check in" a file to a web page that will simplify the process).
- The instructor reads the paper online. Comments can be easily inserted into the file, either by typing them directly into the file (using a different font to make them visible to the student), or by using the "insert comment" feature of Word (WordPerfect has a similar feature). Typing comments directly into the student's work has the following advantages:
- It allows frequently used comments to be copied and pasted into the file without having to retype them.
- You are not forced to squeeze your comments into the white space available in the printed document.
- Students do not have to struggle with reading your handwriting.
- When you are finished making comments in the paper, it can be emailed directly back to the student. This saves class time because you do not have to use time for handing back graded papers. Students can then also ask for additional feedback through email, and you both have copies of the paper to refer to if needed.

B. Feedback from Students

Students can provide two forms of feedback to professors:

- Feedback about the students' team members in group projects (peer evaluations).
- Feedback about the course (course evaluations)

C. Peer Evaluations

The need for student feedback has become increasingly important, especially as professors incorporate group projects into the classroom. Team projects are used in classes in many disciplines; and because determining whether student contributes equally to the overall project is difficult, we use peer evaluations. When developing a peer evaluation, a variety of factors must be considered.

Gathering peer evaluations electronically makes collecting and analyzing the data more convenient. The students fill out a web-based form (see an example in Exhibit 1), which is then either emailed back to us automatically upon submission or placed in a file for later analysis. Regardless of the way in which the data are collected, accurate assessment requires that the peer evaluations be confidential.

Exhibit 1

D. Anonymous Course Comments

Constructive feedback from students can be very valuable. In fact, student feedback was critical in developing the peer evaluation criteria we currently use. Feedback regarding the structure and content of courses, as well as teaching materials and techniques, is also useful. We have found anonymous feedback, gathered through a web-based form, is particularly useful. While our college administers student evaluations at the end of the semester, a web-based form made available to the students throughout the semester allows us to tailor the information that we gather to the content and delivery of the course in time for us to make modifications if necessary. Links to information on how to setup web-based forms can be found below.

IV.   CONCLUSION

We intended to introduce the reader to some of the technology tools available to improve your teaching. None of the tools are a substitute for a well-designed, enthusiastically delivered course. However, by providing new options in course design, we have experienced improved response from our students. While adding technology to your course design does take time, you can now see that you do not have to be a sophisticated technician to take advantage of what the web has to offer.

V.   Links

A. Sources of Business News and Articles

- Business.com: http://www.business.com/
- Brint.com: http://www.brint.com/
- Fortune Magazine: http://www.fortune.com/
- BusinessWeek Online: http://www.businessweek.com/
- The Economist: http://www.economist.com/
- Industry Week: http://www.industryweek.com/

B. Chat Rooms

- http://www.beseen.com/chat/index.html
- http://www.bravenet.com/samples/chat.php
- http://www.multicity.com/servlet/WebsiteServePage/webmasters/chat/index

C. Audio Chat

- http://www.speakfreely.org/
- http://www.telcopoint.com/hearme/hearme-webmaster.html
- http://www.paltalk.com/paltalk/what_is_pt/Group_Text.htm

D. Forms

- http://www.webcom.com/html/tutor/forms/start.shtml
- http://www.htmlgoodies.com/tutors/forms.html

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