Teaching on the Web

Making use of the World Wide Web to support teaching has received a lot of attention worldwide. Virtual universities have been set up and many institutions have used the web for course delivery. Some faculty members in HKUST have also shown interest in this new technology.

What you can do on the Web ?

"There is no definite answer to this question" is the response from all interviewees.

A whole range of teaching-learning activities are possible. For example, Dr. Muppala puts all his lecture notes on WWW for easy accessibility by students. He also has an on-line discussion group with his students from which much useful and timely feedback about the course is collected.

On the other hand, Dr. Andrew Yim's Course Web System provides students with a self-review tool, in the form of multiple-choice questions, so that students can review and recapitulate what they have learnt in class. There is a built-in mechanism to track a student's progress in these self-review exercises and formal tests can also be conducted on-line. In addition, there are on-line course materials and links to related websites.

Towards the 'high-end', there are multi-media learning packages that enable students to learn in the virtual university with a high degree of interactivity. (For interest, try to access the following website and have a look: Carnegie Science Center at http://192.204.241.187 and the "Play with the Robot" at http://telerobot.mech.uwa.edu.au/cgi-win/telerobt.exe of the University of Western Australia.) What you can do on the web can go as far as your creativity stretches, as long as you have the necessary resources!

The following are some common things that you can do on the Web to support your teaching. Given the right web tools, most faculty can do these things without too much effort. Course development tools like "Simple Start" (http://www.unc.edu/courses/ssp/Simple2.html), "TopClass" (http://www.wbtsystems.com/) and "WebCT" (http://homebrew.cs.ubc.ca/webct/intro) are software specially designed to support teaching on the Web and have made teaching on the web a practical option for most faculty.

1. Distributing course materials

Putting all your course notes on the web is now relatively simple. Basically there are two ways of doing this. You can either create web pages, i.e. HTML documents, containing your course notes, which students can read on their web browser. Or you can create a link on your web page to your course notes (assuming that they are already in some computer file format, e.g. MS word documents) to allow students to download them onto their own hard disk or floppy disk. With the latter method students will not be able to read the course notes on their web browser.

For many faculty, their course notes are already in some electronic format , e.g. MS Word documents, so they do not have to retype them in order to put them on the Web. Software is often available to convert those files to Web pages, e.g. "Internet Assistant for MS Word" which can be downloaded from the UST network.

However because web pages can contain a lot of interesting features which you will not have in the printed form, you might want to redesign your course notes to incorporate things like links to other interesting web sites, colorful graphics/images, animation, video and audio clips. Creating links and putting colorful graphics/images (assuming you do not have to create them from scratch) on web pages are easy. Putting video and audio clips would need more resources. Creating animation or interactive web pages can be very labor intensive even if you have the required expertise.

Benefits of using WWW to deliver course materials are multiple, according to Mr. Thomas Ng. "It saves paper and ink; it's fast in distributing information and can reach a large audience; it is flexible in access, with high connectivity to useful information. Users (students) have control over the time and place of their search for information. Furthermore, from the instructor's perspective, there is limited start-up investment time with the existing software tools; the course materials can easily be updated, indexed and searched. It also provides interactive multimedia capabilities and the graphical interface is easy to view and use.".

2. Assessing students

With Web tools like "Simple Start", you can create a quiz and ask students to respond. Their answers will then be sent to you for further processing. If the quiz is an objective test with fixed answers, such as a multiple-choice test, it is often possible for the software to mark the test and send you or the students detailed test results, such as test scores or a list of the items to which a student gave the correct/wrong responses.

Some more sophisticated systems allow you to have an item bank stored in a database and the software can create a test for you in accordance to your specifications, e.g. subject domains, level of difficulty, etc. by picking items from the bank. An example is the Course Web System developed by Dr. Andrew Yim.

3. Collecting feedback from students

Using the same technology, you can also use the Web to collect students' feedback on your course. We are now planning to develop a system for faculty to create teaching /course evaluation questionnaires on the Web. The system will contain a database with hundreds of questions for faculty to choose from. Faculty can also write their own items to be included in the questionnaire. The questionnaire once created can then be administered through the Web. This system will not replace the existing end-of-semester course evaluation. It allows faculty to collect more informal feedback from students.

4. Discussion Forum

Faculty can also create a discussion forum on the Web to allow students/faculty to post questions or comments. Usually it is in the form of a web page listing all the names of students/faculty together with subject headings of the messages they post. These messages can often be sorted by author or date or subject headings. This kind of discussion forum encourages students to engage in meaningful discussion, thus supplementing the face-to-face discussion in class. Students who are less outspoken often find it easier to engage in a discussion using this kind of electronic forum because they can have time to carefully phrase their questions or comments. Similar technology can also be used to facilitate communication among students who are doing group work such as projects.

Note that there is another technology which creates discussion groups using mailing lists but which is not based on the Web. The difference between a discussion group created like this and discussion forum on the Web is that in the former, users will be automatically informed of new posted messages through email, whereas in the latter, the users have to open the web page to find out if there are any newly posted messages.

5. Using a Homepage to organize your course

Usually you would have a home page for each of your courses which you use as an entry point to all your course materials and other useful features such as quizzes and discussion forums. Designing a home page for your course is now a lot easier since many of the Web tools mentioned above have a template that you can use. This is one of the major benefits of using WWW in teaching, as suggested by Dr. Muppala.

Should I put my course on the Web?

"You have to think through what kind of learning experiences you plan for your students and for what purposes." remarked Dr. Muppula. "Providing chances for students to dig up information is important, but the more important part is in helping students to process and organize their information into meaningful learning.".

Some Purposes for using WWW in teaching

A tool to assist students to master some basic concepts

"I saw a need to help my students to master some basic concepts in the subject learning so that they can apply them in solving real-life problems. The on-line multiple-choice tests let students practice with randomly selected questions at the time and place they want. The student's performance is kept track of by the system. In tutorials, similar tests are administered in class. Test results reveal which questions the tutor should pay more attention to in explaining them to the students. Immediate feedback to students on their performance is important." said Dr. Yim. " I also monitor closely the students' progress and respond to their individual questions through the on-line newsgroup. The 'Frequently Asked Questions' section registers all questions raised by students so that they can retrieve them at any time.".

A tool for faculty members to use WWW in their teaching

"I developed this Course Web System as a shell so that other colleagues can fill in their subject content materials and use it to facilitate their students' learning." Dr. Yim stressed. "The next development stage of the system may involve annotations to difficult questions with explanation and the involvement of students in selecting the best learning-facilitative questions.".

A tool for students to prepare for class

Dr. Muppala has different educational purposes to meet. "I have all my lecture notes on web so that students can access them with flexibility. They can read them before class, attend class to see to my further explanation and application (value-added!), and use them as a reference while they are working on their projects. Through the web, I relate my students to useful websites and guide them to explore. In return, my students share with me a lot of interesting ideas and information from their hunting." .

A tool to foster closer communication between instructor and students

"The newsgroup helps to foster an immediate, closer and documented communication between instructor/tutors and students. Both myself and my tutors promise to respond to students' questions within 24 hours, take a note of their difficulties and provide timely assistance." said Dr. Muppala.

A tool to organize the course

"I also take this as a natural way to maintain the history of a course. It's neither technical nor time-consuming. The information of a course can easily be shared among colleagues in the department. In fact, it does happen in our department." said Dr. Muppala.

Some technical and practical concerns

In practical terms, there are two major concerns about using WWW in teaching. The first one is the availability of Web tools software.

Second, is the time and resources you are willing to spend. For example if you are willing to do Web programming using languages like Java, you can actually do a lot of interesting things on the Web, like the ones you see on those fancy commercial Web pages. Furthermore, with web technology progressing at the current pace, what cannot be done or can only be done with great difficulty today could become straightforward with the advent of new software.

In addition, there are two essential questions to answer:
• Do my students have easy access to the Web?
• Do my students have the basic computer skills? said Drs. Muppala & Yim.

Dr. Yim's experience showed that some of his accounting students lacked basic computer skills to learn from the Web and their access to computers on campus during certain peak periods was constrained. Few of his students have access to the University's network from home. Dr. Muppala also acknowledged the problem and feels grateful to his department for its computing facilities.

Advice from the experienced

"Have a clear idea of what to have on-line. Visits to other websites can help to gather a lot of interesting ideas.".

"Have a modest start. Web programming can be very time-consuming and demands a steep learning curve on the part of instructor who is not necessarily a computer programming expert. Use existing software instead.". (Dr. Yim's project which involved a software development took three people, including himself, working almost full-time for nine months to complete!)

" If there is a whole bunch of references for students, putting them on web would save a lot of students' time lining up in the library for the needed materials. However, if the notes are an interactive handout on which students have to work in class, it would be more desirable to print and distribute them in class to ensure the learning activity can go on as planned.".

"Don't go in for over window-dressing on Web. Keep the Web pages neat and tidy with essential and simple information.".

"Don't attempt to incorporate multi-media productions (even though you do not have to develop them!) except if it really helps students learn. Substance, on most learning occasions, is more important than form.".

"Web is a tool for teaching. It is not teaching. The instructor is responsible for the teaching.".