Case Studies of Using Web in Teaching in HKUST

Issue 18/97 of the *Teaching-Learning Tips* titled "Teaching on the Web" discussed about the possible uses of WWW in supporting teaching and suggested guidelines on the adoption of the new technology.

A year later, in this issue, we are reporting three examples of using WWW in teaching at HKUST. There are in fact many examples of innovative uses of Web in HKUST. The ones that are reported here are those that have close involvement with the Instructional Development Unit (IDU) and to some extent, represent different approaches in the adoption of the Web technology in local higher education.

The three reported teaching development projects of Dr. Irene Lo (CIVL), Dr. Jogesh Muppula (COMP) and Dr. Albert Yu (BIOL) were sponsored by the Staff Secondment Scheme initiated by IDU. The intention was for participants of the Scheme to be partly released from their normal duties to engage in these teaching development projects with professional and technical support from IDU.

It is always our intention to report on in-house innovative ways to teach and invite comments and discussions from our readers. Faculty and staff who have used Web in their teaching are always welcome to make use of the *Teaching Learning Tips* as a forum for discussing their experiences.

The Editor

Web-based Teaching

In the past year, IDU has been working with three faculty members in assisting them to make use of the Web for teaching purposes. On top of that, with the additional support from an Action Learning Project grant, Dr. Jogesh Muppula (COMP), one of the three participants of the Staff Secondment Scheme aforementioned, together with Tak S. Ha of IDU have completed their first attempt to evaluate these three projects. What follows is an introduction to the projects, which shows the many different ways that Web can be used in teaching, and some preliminary evaluation results, both from the Project Leaders and the Evaluation Team.

CIVL141—a Web-based Course by Dr. Irene Lo

The project was started with the idea of putting the basic and relatively simple course materials on web with built-in self-assessment that students can learn the materials independently before they come to the class/lecture to discuss more difficult topics, particularly on the application of some important concepts.

With the assistance of IDU, Dr. Lo has re-designed her course built a course website with a number of interesting features including multimedia elements, photos, on-line quizzes (self-assessment for students) newsgroup, class announcement, chapter text summary and on-line teaching evaluation.

About 120 students took the course and their evaluation of the project showed that Dr. Lo's idea did work.

"I spent less time on the basic materials than before. Students did participate more actively in lectures as the semester progressed…They understood the materials better and asked more meaningful questions in class." Dr. Lo disclosed.

However, putting the basic materials on the Web for independent learning did not imply that she did not have to cover them in her lecturers. "Students sometimes had difficulty with the materials on Web. I have to spend time going over them," Dr. Lo said.

"It did not save time and effort in teaching."

Being asked about her evaluation of the overall project, Dr. Lo remarked that her effort spent in designing the curriculum, developing the Website, maintaining and modifying the materials, interacting with her students through the Web etc. has exceeded her expectation, though she never thought she could spend less time on her teaching through the use of the Web.

COMP 252 - a Web-based Course by Dr. Jogesh Muppala

Dr. Muppala is a very experienced user of the Web for teaching purposes. It has been his third time to use the Web to teach COMP 252.

In the course website, students could access to course schedules, course notes, class announcements, assessment results, project information, sample problems, online quizzes, and useful links etc. The course notes were in postscript format that the students could either save to disk or read them by invoking a viewer. According to Dr. Muppala, students made a lot of use of the online quizzes, especially when the examination is near.

The 'designated hitter' effect of emails

As for the communication part, students opined that email was a useful asychronous mode of communication and over 75% of student-respondents preferred it to face-to-face discussions. They found it less threatening and provided a permanent record. However, the more articulate students still preferred face-to-face discussions for the convenience.

Email-log showed that only a small group of students made regular use of emails and newsgroup discussion. There were evidences that what they learnt from the newsgroup or emails, they passed them on to other non-users, something which Dr. Muppala called the "designated hitter" phenomenon, a term borrowed from American baseball. Further information on the research project can be found at http:// www.cs.ust.hk/~muppala/ALP9697EG05.html

Dr. Albert Yu's experience with using the Web for teaching

Dr. Yu made use of the Web in two of his courses (BIOL 001 & 202) he taught in the Spring Semester 97/98. He did not find it necessary to re-design his course in order to make use of the Web. With the help of a student helper, he put his course materials on the Web. In the process, he also learnt how to edit his course materials, convert them to a format (HTML) that can be displayed on the Web and upload them on the website. This he found very useful because students would have access to the most updated version of his course materials.

Website as an information center

He found his students attend his class more regularly (about 90%); they seemed to be learning more effectively; and followed the course more easily. "The website is like an information centre to which the students can have convenient access virtually anytime for course materials, links to other sites and announcement," said Dr. Yu.

He planned to include on-line quizzes, photos - something he considered most useful for teaching his subject, and probably animation to his website in the coming year.

As for advice for other instructors wanting to use the Web for their teaching, "It would be important to secure adequate support, especially if you are not familiar with the web technology," Dr. Yu remarked.

Lessons learnt:

Dr. Muppula and his partner adopted an Action Research approach in their Web-based teaching evaluation project, that involved 250 students in three sections of an undergraduate computer science course and three groups of students enrolled in three courses from different departments in past two semesters, plus three instructors including himself.

Results from the study showed that five important issues have to be properly addressed in using web as an adjunct to the traditional classroom delivery in tertiary education.

The SCARE factors

The five factors, with an acronym of SCARE are:

Skills : students' level of Web and computing skills and their comfort levels with the technology

Connectivity : the networking infrastructure connecting the computers

Accessibility : accessibility of students to computers

Reward : pragmatic nature of students and their willingness to undertake new ventures when there is at least a (perceived) reward

Enthusiasm : appropriate self-motivation for using the technology

Surveys of students showed that student-respondents were generally Web-savvy enough to make use of the Web in their study. There was satisfactory network connectivity on campus and students' accessibility to computers was high. However those who lived off-campus did experience some frustrations to connect their computers to school due to the heavy demand for the dial-in modem lines.

As expected, students preferred well-organized websites that provide easy access to information and valued those course notes, handouts, guidelines, sample problems, model answers and exam guidance provided by the instructors.

"Most students only see grades as incentive/rewards to learning."

Over 65% of student-respondents tried the on-line quizzes and found them useful. However since the course grade did not depend upon the on-line quizzes, students tended to use them only when they had time (a reward issue). It seemed that few students would consider learning itself or mastery of knowledge as a reward whereas majority would see grades as reward. Students also suggested to assign some graded coursework based on the information gathered from their exploration of some suggested hyper-links.

Web-based course cannot save paper

Another interesting finding is that students always print the course materials from the Web. Until there is a change in students' studying habits, putting course materials on the Web probably will not save paper.

Epilogue by the Editor

Tak S. Ha and his colleagues in the Instructional Development Unit (IDU) have examined more than 30 web tools available in the market that can be adopted by instructors to develop their web-based courses. Findings would be available soon to provide some guidelines in adoption of a particular web tool and its possible effect in enriching/enhancing the teaching-learning process.