The application of Web-based teaching and learning in tertiary institution – a case study in Hong Kong

Alex C. W. FUNG & Frank H. K. FU; W. S. CHEUNG

Hong Kong Baptist University   Technological University Nanyang

The experience of a two-year project to promote the use of Web-based teaching and learning at XXX University was presented. A total of 68 courses over two semesters were included in the study. Surveys of students and teachers suggested that the quality of learning and teaching were improved. Over 80% of the students had used Web-based teaching and satisfied with its results and a majority of them would continue to use WebCT in the future. It was found that students developed a more favourable attitude toward the subjects and the teachers in the process. Teachers were delighted with the results and appreciated the support made available to them through the project team. Some even volunteered to be "mentors" for future novice teachers in this endeavour.   Reservation and resistance offered by a few university administrators were noted and their concern would provide future challenges and targets for improvement. It is concluded based on the case study at XXX University, Web-enhanced/based teaching and learning is a trend that cannot be overlooked and should be seriously considered for adoption by tertiary institutions.

Keywords: Quality teaching and learning

在香港大專院校推行網上教學的研究

香港浸會大學的網上教學計劃，已試行兩年，現就計劃的施行作出報告。為了進行審慎的研究，我們於兩個學期內，抽取六十八個課程作深入調查。從對學生和教師的調查報告，顯示學習和教學的質素均有所改善，超逾八成學生都有利用互聯網學習模式，並且滿意其教學效能，而大多數學生亦表示將來仍會繼續使用這種學習模式。我們發現學生們在學習過程中，一般都能培養出對學科和教師的正確態度。而教師們也十分認同教學的效果，並且對網上教學計劃的支援組隊所提供的協助極為欣賞，有些教師更自薦作為未來新_與本計劃的教師之導師。然而，一些大學的行政人員對網上教學計劃是有保留和抗拒，我們都會關注他們意見，並且把他們的顧慮作為網上教學計劃的未來挑戰和改善目標。總結而言，基於香港浸會大學在網上教學計劃的經驗，互聯網學習模式乃是勢之所趨，不容忽視，而且應為各大專院校嚴加考慮之教學模式。

關鍵詞：優質教學

Introduction

In the last decade, the use of information and communication technology (ICT) has been playing an important role in education. The rapid growth of its usage in schools is mainly because more and more schools are provided with computers with Internet access. Internet technology provides a platform which allows individuals to access and exchange information. Many applications have been developed to allow educators and students to access and exchange information in the cyber world, such as WWW browser, email, Internet Relay Chat, list-servers, electronic bulletin boards, asynchronous discussion group, and audio / video conferences. As a result, teachers and students could benefit from the technology. Some of the potential benefits include "its use as a stimulant for collaborative learning, its flexibility of use in teaching, the ability to eliminate limitations of instructional

processes from the bounds of time and space, and the opportunities that arise from its use in achieving cross-cultural co-operation." (Braak, 2001).

Characteristics of "Web-Based" learning environment

Usually "E-learning" and "Online Learning" are used to describe "Web-Based" learning in literature reviews. We understand that these terms are used in papers and books to refer to a learning environment that has the following characteristics (Liaw and Huang 2000; Rosenberg 2001). First, instructional materials can be delivered over the WWW. Second, it can provide hypermedia resources for the participants to use (Greene and Land 2000). Third, it can provide opportunities for participants to interact with each other on the web. Based on the above characteristics, educators can design and develop an instructive learning environment, constructive learning environment, social constructive learning environment or a combination of these for their students.

Models of Implementing "Web-Based" teaching and learning environment

According to the International Data Corporation (Yap 2001), "Web-based" learning will be growing very fast in the next two to four years in the Asia-Pacific region. It is estimated to be worth about US$462 million. More and more universities have been implementing "E-learning" in Asian countries.

Universities and schools, when developing "web-based" teaching and learning environment, would have different approaches in their implementation. Some use the web to deliver materials such as schedule, course outline, lecture notes, and reading lists. Some use it to provide abundant resources for students to do their projects (Greene and Land 2000; Javid 2000). Some use it to provide a social constructive environment for peer-to-peer learning, group learning, and student-facilitator coaching (Driscoll 1997; Greene and Land 2000; Hung 2001). As a Web-based learning environment can be "personalized" for individual learners (Hung and Nichani 2001), it is foreseeable that the technology will be used more to suit individual learners' different profile.

The Challenge of Implementing "Web-Based" Learning Environment in Institutions

To diffuse "Web-Based" technology in teaching and learning is not a simple task (Fabry and Higgs 1997). The challenge of diffusion in an innovation is to narrow the gap between "what is known and what is actually put into use" (Rogers 1995). "Web-Based" learning environment is a new platform for teachers and students. Fabry and Higgs (1977) suggested the major factors affecting the implementation of technology are teachers' attitudes, professional development, access, and cost. We agree with them that these are the major factors. Furthermore, we believe the major indicator to measure the success of the innovation is the acceptance of it by the teachers and students.

According to Roger (1995, p.7), "many technologists think that advantageous innovations will sell themselves, that the obvious benefits of a new idea will be widely realized by potential adopters, and that the innovation will therefore diffuse rapidly. Unfortunately, this is very seldom the case. Most innovations, in fact, diffuse at a surprisingly slow rate." Roger (1995) also suggested the centralized diffusion and decentralized diffusion approaches. We believe the centralized diffusion approach is appropriate to disseminate the basic use of "Web-Based" teaching and learning environment in the initial stage. With this approach, institutions need to take initiation to provide training, give support, and guidance for teachers and students in using the new technology. This may speed

up the rate of diffusion of the technology. After the users accept the new technology, the decentralized diffusion approach should follow. In other words, after the teachers and students have adapted to the basic "Web-Based" teaching and learning environment, we should encourage them to explore further potentials of using the technology in their own fields.

Harmon and Jones (2000, p.28) suggested "five levels of use of the Web common in schools, colleges, and corporate training". The five levels are (1) information web use, (2) supplemental web use, (3) essential web use, (4) communal web use, and (5) immersive web use. Level 1 (i.e. information web use) refers to the level in which information is provided for administrative purposes. It may not provide course content. Level 2 (i.e. supplemental web use) refers to the level which provides supplemental course materials for learners such as course notes and handouts. Level 3 (i.e. essential web use) refers to the level which provides necessary course materials for the learners. Learners have to access the web to get their course materials. Level 4 (i.e. communal web use) refers to the level in which "classes meet both face-to-face and online" (Harmon, Jones, 1999, p.29). This allows students and teachers to have online interactions on the web as well as traditional face-to-face class interactions. Level 5 (i. e. immersive web use) refers to the level in which "all of the course content and course interactions occur online" (Harmon, Jones, 1999, p.29). These five levels provide a framework of understanding the diffusion of "Web-Based" teaching and learning environment in an institution, and is used in this paper in analyzing the case at the Faculty of Social Sciences of XXX University.

Diffusion of "Web-Based" Teaching and Learning Environment

Web-based teaching and learning at the XXX University was first initiated in 1997 by the Academic Registry when it developed its own Web Course Homepage (WebCH) System to encourage individual colleagues to use the web to support teaching. In November 1999, the Faculty of Social Sciences launched a two-year project representing a more formal, faculty-based approach to the use of web-based teaching and learning among its seven departments. These include the Department of Education Studies, Department of Geography, Department of Government and International Studies, Department of History, Department of Physical Education, Department of Social Work, and Department of Sociology. This project titled "The Development of a Social Sciences Teaching and Learning Community with the Integration of Information Technology" (SSTLC) was led by the Dean of the Faculty of Social Sciences and supported by the University Grants Committee (UGC) Teaching Development Grants (TDG).

The major objectives of the TDG project were:

1. To systemically support the development of Wed-based and Web-assisted subjects in the Faculty of Social Sciences.

2. To systematically support the participating staff in the use of Information Technology in the Faculty of Social Sciences and

3. To develop an efficient and integrated design as well as a coordinated working strategy for the implementation of IT for instructional purposes.

The Project Team (with 1 Project Manager, 2 Technicians, and 4 Project Assistants) was formed in late 1999, and the first batch of subjects was released on a trial basis to students in mid-February 2000 after the semester started. The WebCT available from www.webct.com) was chosen as the platform and 15 subjects were put on it subsequently to support teaching and learning. In other words, the WeBCT was used as a complementary platform in addition to the normal face-to-face teaching of these subjects, matching the objectives of the TDG project. We adopted the centralized diffusion approach in the initial stage.

Training workshops on the use of WebCT were organized for the lecturers and students involved, and 18 lecturers and about 910 students were trained in this first phase of trial in the project.

In the second phase of the project implementation (i.e. the academic year 2000/01), 23 subjects from the seven departments were supported with WebCT in the first semester, involving 1,026 students enrolled. These figures rose respectively to 30 subjects and 1,390 students in the second semester. At the end of each semester, a questionnaire survey (on a subject basis) was conducted to collect feedback from students on the related issues of this innovation of web-based teaching and learning. Major findings of these two surveys are reported in the following sections.

Surveys to collect students' feedback

Two questionnaire surveys to collect student feedback on web-based teaching and learning were conducted in the SSTLC project, with the objectives to identify barriers and motivational factors of the participating students as well as the demand and pattern of usage. The first survey (Survey I) was conducted in December 2000 at the end of the first semester, and the second (Survey II) was done at the end of the second semester in June 2001. In Survey I, 719 students responded out of 1,026 students with a response rate of 70%. In Survey II, the response rate was about 60% with 823 students responding out of 1,390. The results of the surveys are presented in the following eight sections.

1. Profile of respondents

Most of the students in Survey I for the 1st semester 2000-01 had little or no experience in web-supported subjects as the project was launched only formally in September 2000. For the students in the 2nd semester involved in Survey II, about one-third (33.4%) had not taken any WebCT supported subjects before. Most of the students had taken one or two web-based subjects in both semesters; but there was a notable increase from 9.4% to 27.1% for those taking three subjects in the 2nd semester when compared to the 1st semester (Table 1). This is the natural consequence with the increase in the number of WebCT supported subjects implemented in the 2nd semester.

Table 1. Number of WebCT supported subjects taken by students in Survey II

Number of WebCT supported subjects taken	In 1st semester 2000-01			In 2nd semester 2000-01		
	Frequency (N=811)	Percent	Cumulative Percent	Frequency (N=797)	Percent	Cumulative Percent
0	271	33.4	33.4	-	-	-
1	234	28.9	62.3	257	32.2	32.2
2	194	23.9	86.2	242	30.4	62.6
3	76	9.4	95.6	216	27.1	89.7
4	30	3.7	99.3	59	7.4	97.1
5	4	0.5	99.8	19	2.4	99.5
6 or more	2	0.2	100	4	0.5	100

To access the subject homepage, quite a high percentage (40.9 in 1st semester; 55.3 in 2nd semester) of respondents used computing facilities both at home and on campus. The cumulative percentages 59.4 and 67.2, as shown in Table 2, provided incidentally also an estimation of the percentage of respondents with access to the Internet at home.

Table 2. Access at home and on campus

Location to access the Internet for the subject homepage	Frequency (N=718)	Percent	Cumulative Percent	Frequency (N=823)	Percent	Cumulative Percent
Both at home and on campus	294	40.9	40.9	455	55.3	55.3
At home only	133	18.5	59.4	98	11.9	67.2
On campus only	173	24.1	83.5	142	17.3	84.5
None	118	16.5	100	128	15.5	100

2. Use of subject homepage by students

Frequency of access - In the 1st semester, 22.5% of the students never accessed their subject homepage on the WebCT. This figure dropped to 15.8% in the 2nd semester, indicating an improved rate of use. The majority of respondents (59.2% in Survey I; 49.8% in Survey II) accessed the subject homepage only once or twice in a week; and 11.4% of respondents accessed only a few times in the semester (Table 3).

Table 3. Frequency of access

Frequency of accessing subject homepage	1st semester (Survey I)		2nd semester (Survey II)	
	Frequency (N=710)	Percent	Frequency (N=821)	Percent
Never	160	22.5	130	15.8
1-2 times per week	420	59.2	410	49.8
3-4 times per week	91	12.8	114	13.8
5-6 times per week	22	3.1	36	4.4
7 times or more per week	17	2.4	23	2.8
5 times / less per semester	-	-	94	11.4
More than 5 times per semester	-	-	9	1.1
Others	-	-	5	0.6

3. Reasons for not accessing

Those respondents who never accessed their subject homepage gave various reasons for their 'non-use' (Table 4), and these reasons differed in the two semesters. The major reason indicated by 44.3% of 160 non-users in the 1st semester was "Don't know homepage address". This probably was due to insufficient publicity in the 1st semester and the situation improved in the 2nd semester with only 25.4% of 130 non-users picking this reason. In

the 2nd semester, the major reason for not accessing the subject homepage, selected by 37.7% of the non-users, was the lack of time. Following this is the reason "Not useful/necessary" (28.5% of the non-users), in contrast to the very low 0.03% picking this reason in the 1st semester. Lack of interest in web-based learning is also a reason high on the list, which is understandable as different students have different learning styles.

Table 4. Reasons for not accessing subject homepage

	1st semester (Survey I)		2nd semester (Survey II)	
Reasons for not accessing subject homepage	Frequency (N=160)	Percent	Frequency (N=130)	Percent
Don't know homepage address	71	44.3	33	25.4
Don't know how to access	-	-	22	16.9
Forget the password	1	.6	17	13.1
Not interested in the subject	18	11.3	16	12.3
Not interested in web-learning	31	19.4	33	25.4
Not comfortable using computers	21	13.1	9	6.9
Don't have the time	21	13.1	49	37.7
Not useful/necessary	5	3.1	37	28.5
Materials on the web duplicate those in class	27	16.8	16	12.3
Don't know / forget about the subject homepage	5	3.1	3	2.3

* Multiple selections of reasons permitted

4. Reasons for accessing

For those who do access the subject homepages, the major reason consistent in both semesters is that the materials provided are helpful to study. Requirement and/or encouragement from lecturers are also key factors influencing the use of the subject homepage.

When we use Harmon and Jones' framework (Harmon, and Jones' 1999) to analysis the data between the two semesters, it is interesting to note, in Table 5a, the great increase between the two semesters in responses for the two items "Need to upload/download subject materials" (from 2.0% to 58.2%) and "Check out subject materials" (from 1.8% to 47.7%). Apparently this reflected that both lecturers and students have got accustomed to using the WebCT in the 2nd semester, at least for information dissemination (i.e. Level 1: information web use).

We classify the following items, "Lecture notes / outline", "Print notes", "Presentation", "Supplementary readings", "AV materials / Movies", and "Bookmarks", into Level 2 (ie supplemental web use). There is an increase in the responses for "Lecture notes / outline" (65.6% to 69.2%), "Presentation" (from 8% to 11.8%), and "A/V materials /movies (from 4.1% to 7.7%). However, there is a decrease in the responses for "Print Notes" (48.1% to 46.6%), "Supplementary readings" (from 26.7% to 13.2%), and "Bookmarks" (from 4.4% to 1.7%). The number of students in using the "supplementary reading" features on the web decreases. We believe the major reason may be the lecturers are concerned about the copyright issue. As a result, do not want to put the "supplementary reading" on the web. It seems to us that Level 2 is growing in a slower pace.

We group the following items, "Required readings", "Assignment", "Quiz / Test" into Level 3 (ie essential web use). There is a decrease in the responses for the three items (ie "Required readings" from 33.7% to 29.2%; "Assignment" from 29.4% to 20.8%; "Quiz / Test" from 10.9% to 6.4%). We believe there are good reasons for it. First, there are 23 subjects involved in the 1st semester; however, there are 30 subjects involved in the 2nd semester. As a result, we believe those newly involved subjects are only at level 1 or level 2 so that when we calculate the percent of those items in level 3, there is a decrease.

We also have two items which belong to Level 4 (ie communal web use). They are "Bulletin Board / Forum", and "Communication with others". "Bulletin board / Forum" refers to online discussion board setting while "communication with others" refers to sending out individual emails. Though the communication between 2 individuals decrease from 5.1% to 4.9%, the communication among the individuals does increase from 14.4% to 18.1%. It seems to us that more students are using the web based discussion board more often than before. From the data in Tables 5a, 5b, and 5c, it is clear that we have not reach to Level 5 (i.e. immersive web use) yet.

Table 5a. Reasons for accessing subject homepage

Reasons for accessing a subject homepage	1st semester (Survey I)		2nd semester (Survey II)	
	Frequency (N=547)	Percent	Frequency (N=696)	Percent
It's required by lecturer(s)	206	37.7	258	37.1
Lecturer(s) encourage doing so	226	41.3	228	32.8
Materials provided are helpful to study	332	60.7	386	55.5
Materials provided are interesting	87	15.9	87	12.5
It's habit	88	16.1	77	11.1
Need to upload/download subject materials	11	2.0	405	58.2
Check out subject materials	10	1.8	332	47.7
Using WebCT tools	1	0.002	17	2.5

* Multiple selections of reasons permitted

Table 5b. WebCT features often used

WebCT feature(s) of the subject homepage students often use	1st semester (Survey I) Frequency (N-540)	Percent	2nd semester (Survey II) Frequency (N=689)	Percent
Lecture notes/outline	354	65.6	477	69.2
Required readings	182	33.7	201	29.2
Print notes	260	48.1	321	46.6
Calendar	68	12.6	94	13.6
Bulletin Board/Forum	78	14.4	125	18.1
Student homepage	48	8.9	83	12.0
Presentation	43	8	81	11.8
Assignment	159	29.4	143	20.8
Quiz/Tests	59	10.9	44	6.4
Supplementary readings	144	26.7	91	13.2
Relevant Web links	92	17	92	13.3
A/V materials/movies	22	4.1	53	7.7
Bookmarks	24	4.4	12	1.7
Staff profile	20	3.7	19	2.8

* Multiple selections of reasons permitted

Table 5c. Most important features with web-based teaching

The most important features with web-based teaching	1st semester (Survey I) Frequency (N=622)	Percent	2nd semester (Survey II) Frequency (N=713)	Percent
Lecture notes & readings	410	65.9	515	72.2
Supplementary AV materials, Web links	113	18.2	98	13.7
Tests and assignments	67	10.8	65	9.1
Communications with others	32	5.1	35	4.9

5. Satisfaction with web-based learning and teaching

Students' overall level of satisfaction with web-based learning was found to be quite positive in both semesters. Around 80% of the respondents rated their satisfaction between 'average' to 'very satisfied' on a 5-point scale (Table 6a), with a similar mean of 2.08 for both semesters. These figures matched quite well with the students' feedback on their preference for web-based teaching in the following semester (Table 6b), where it can be seen again that the majority (around 80%) chose to have the support with the technology.

Table 6a. Students' satisfaction with web-based learning

Satisfaction with web-based learning in the subject	1st semester (Survey I)			2nd semester (Survey II)		
	Frequency (N=676)	Percent	Cumulative Percent	Frequency (N=797)	Percent	Cumulative Percent
1 = very satisfied	17	2.5	2.5	13	1.6	1.6
2 = satisfied	179	26.5	29.0	238	29.9	31.5
3 = average	344	50.9	79.9	390	48.9	80.4
4 = dissatisfied	119	17.6	97.5	112	14.1	94.5
5 = very dissatisfied	17	2.5	100	44	5.5	100

Table 6b. Students' preference for web-based teaching

Preference for web-based teaching in the coming semester	1st semester (Survey I)			2nd semester (Survey II)		
	Frequency (N=682)	Percent	Cumulative Percent	Frequency (N=759)	Percent	Cumulative Percent
1 = very much	97	14.2	14.2	87	11.5	11.5
2 = much	246	36.1	50.3	250	32.9	44.4
3 = average	237	34.8	85.0	274	36.1	80.5
4 = not much	70	10.3	95.3	77	10.1	90.6
5 = not at all	32	4.7	100	71	9.4	100

Other aspects related to satisfaction also surveyed included (a) Sufficiency of materials provided on the subject homepage; (b) Lecturer's responsiveness on the Web; (c) Lecturer's encouragement of web-based learning; (d) Helpfulness of materials on the subject website for learning (Survey II only); and (e) Proper balance between web-based teaching and traditional teaching method used by lecturer (Survey II only). The mean values of these responses, all measured on a 5-point scale, are presented in Table 7.

Table 7. Other aspects related to satisfaction

Ratings from 1 to 5 for the following:	1st semester (Survey I) Mean	2nd semester (Survey II) Mean
(a) Sufficiency of materials provided on the subject homepage	2.16	2.09
(b) Lecturer's responsiveness on the Web	2.24	2.17
(c) Lecturer's encouragement of web-based learning	1.91	1.88
(d) Helpfulness of materials on the subject website for learning	--	2.07
(e) Proper balance between web-based teaching and traditional teaching method used by lecturer	--	2.18

1 = very sufficient, 2 = sufficient, 3 = average, 4 = insufficient, 5 = very insufficient; with slight variations in wordings for (a) to (e).

6. Computer facilities on campus

The final part of the surveys concerned the computer facilities available to students on campus to access the subjects online. Issues surveyed included the convenience of location, the sufficiency of computers, the opening hours for access, and the loading speed of websites. Except for the number of computers that about 50% of respondents considered (very) insufficient, the other three aspects were rated average and above (Table 8).

Table 8. Computer facilities on campus

Location of computer centres on campus	1st semester (Survey I) Frequency (N=469)	Percent	Cumulative Percent	2nd semester (Survey II) Frequency (N=601)	Percent	Cumulative Percent
Very convenient	35	7.5	7.5	50	8.3	8.3
Convenient	163	34.8	42.2	199	33.1	41.4
Average	147	31.3	73.6	240	40.0	81.4
Inconvenient	94	20.0	93.6	92	15.3	96.7
Very inconvenient	30	6.4	100	20	3.3	100
Number of computers on campus	Frequency (N=467)	Percent	Cumulative Percent	Frequency (N=598)	Percent	Cumulative Percent
Very sufficient	6	1.3	1.3	15	2.5	2.5
Sufficient	96	20.6	21.8	88	14.7	17.2
Average	136	29.1	51.0	172	28.8	46.0
Insufficient	149	31.9	82.9	198	33.1	79.1
Very insufficient	80	17.1	100	125	20.9	100

Opening hours of computer centres on campus	Frequency (N=468)	Percent	Cumulative Percent	Frequency (N=598)	Percent	Cumulative Percent
Very convenient	29	6.2	6.2	28	4.7	4.7
Convenient	148	31.6	37.8	173	28.9	33.6
Average	155	33.1	70.9	246	41.1	74.7
Inconvenient	100	21.4	92.3	115	19.3	94.0
Very inconvenient	36	7.7	100	36	6.0	100
Loading speed of websites on campus	Frequency (N=470)	Percent	Cumulative Percent	Frequency (N=597)	Percent	Cumulative Percent
Very fast	38	8.1	8.1	38	6.4	6.4
Fast	171	36.4	44.5	190	31.8	38.2
Average	168	35.7	80.2	240	40.2	78.4
Slow	73	15.5	95.7	109	18.3	96.7
Very slow	20	4.3	100	20	3.3	100

7. Problems and prospects of web-based learning

Web-based teaching and learning is an innovation in both technology and pedagogy. The descriptive findings in the previous sections of the SSTLC project at the XXX University illustrate that the application of "Web-Based" teaching and learning takes time and patience. The project took several months to first set up a supporting team and the necessary technical platform with the WebCT, before a trial could be started in the middle of a semester together with training for the instructors and students.

In this project the web was only used in a complementary sense to support normal teaching, which was different from having the courses put on-line for self-learning. Subject instructors were given the autonomy of deciding how they used, and what to put on the WebCT. The only requirement from the Faculty of Social Sciences on the seven departments was that each participated in the project with six subjects in the academic year 2000-01. This simple policy was necessary in view of the varying nature of the subjects, as well as the different attitudes and technical abilities of faculty members regarding the innovation. This accounted for the 22.5% and 15.8% non-users respectively in the 1st semester and 2nd semester, with the gratification to see that the improvement in the latter as the project progressed.

Awareness on the part of students is an important factor for the innovation's success. The formative evaluation with Survey I was useful to indicate that 44% of the student non-users "Don't know the homepage address". With additional promotional activities by the project team in the 2nd semester, this figure dropped to 25 %.

For the 15.8% of non-users in the 2nd semester, it is interesting to note that their major reason was "Don't have the time", instead of the "Don't know the homepage address" problem indicated in the 1st semester. This possibly is related to the need to attend to examinations in the 2nd semester, and also reflects that there is still a small portion among students who are quite "traditional" book-learners. In fact this culture is also reflected in the emphasis put by the student users on "Lecture notes" as the most often used and most important feature of WebCT.

8. Summary

In summary, the project implementation in the academic year 2000-01 was a success up to a basic level of usage of the WebCT. 80% of the students had used the system mostly for one to two subjects, and the overall satisfaction of these users is above average. The majority of students preferred to continue using the web-based approach for learning (11.5% very much preferred; 32.9% much preferred) and this is an encouraging result. Some students commented also that the use of WebCT should be promoted and encouraged university-wide across other subjects, while at the same time calling for the provision of more computing facilities.

Thus far, the project seemed to have achieved only some degree of improved efficiency in the teaching and learning process – in providing an alternative channel for information/materials dissemination. The interactive and communicative features of web-based learning are yet to be developed and explored, as "Communications with others" was the least important function from the students' point of view (and perhaps this was also the perception of the instructors too). The teachers and the system managers must be aware of the importance of tailored made programmes and the needs for continual refinements and promotion.

Hopefully in the future, instructors will make an effort to encourage students to use more the "Web-Based" environment (i.e. asynchronous and synchronous discussion tools) to do group project work and to co-construct knowledge (Driscoll 1997).

Implications and the way forward

In more and more countries, Government funded institutions have been asked to demonstrate that they have a sound system in monitoring the quality of teaching. Recognizing that it would be difficult to assess the product in terms of value-addedness in so many subjects, the foci were primarily on the process of teaching and learning as reflected from the surveys of the students. The project has also noted that areas such as the application of information technology in education, the use of Web enhanced/based teaching and learning, the interaction between teacher and student, the development of life-long learning attitude, the development of problem identification and solving skills, the identification and assessment of quality teaching and learning process, and the responses to community needs were important contributors to the teaching quality assurance review process.

The impact of the present project, on a microscopic scale, is reflected by the significantly improved teaching evaluation scores of the courses (68) involved, suggesting that students developed a more favorable attitude towards the subjects and the teachers. Teachers were delighted with the results and appreciated the support made available to them through the UGC grant (TDG). It success has led to the establishment of a team to serve the entire university but with a smaller scale. It is hopeful that the successful experience at the Faculty of Social Sciences would be shared by others. Another encouraging outcome is the availability of a pool of teaching staff who are willing to be mentors to "novice" teachers in using Web-enhanced/based teaching. Together with regular training workshops and seminars, the success of the present project can be maintained and extended to other faculty members. In due course, collaborations among faculties will emerge and more teachers and students will be able to take advantage of this synergy.

With the availability of computers on most campuses, the use of IT in education and thus Web-enhanced/based teaching and learning will become a basic feature of any modern university. Students will demand such facility/service and expect interaction with their peers, teachers, and others through the Internet. As students become more receptive to Web-based

teaching and learning, teachers can develop their instructional strategy accordingly such as in supplementing their lectures with more high technology audio-visual aids, in developing more self-learning modules, in developing more problem-solving and problem-identification exercises, and in challenging the critical thinking process as well as in providing a wealth of sources of information. It is conceivable that resources from other campuses can be tapped and incorporated as part of the teaching and learning process, and interchanges with faculty and students from all over the world can be established.

There will be, however, reservation and resistance offered by a few university administrators, faculty members and students in the adoption of Web-enhanced/ based teaching and learning. Their concern includes the importance of face-to-face contact between teacher and student in the delivery of quality learning, the danger of relying too much on high technology and the computer, poor management of time by the student and teacher in the use of computer, the compliance with the copyright laws, the financial requirements and implications, and possible health problems associated with a hypoactive/sedentary/cybernetic lifestyle.

The challenges ahead will therefore be to ensure that the use of Web-enhanced/based teaching and learning is tailored-made according to individual needs (Hung and Nichani 2001) and that it is not over-bearing and counter-productive. It is a trend that we are committed to further promote and develop and we are confident that this will contribute to better quality teaching and learning.

References

Braak, J. V. (2001). Factors influencing the use of computer mediated communication by teachers in secondary schools. Computers & Education 36(1): 41-57.

Driscoll, M. (1997). Defining Internet-Based and Web-Based Training. Performance & Instruction 36(4), 5-9.

Fabry, D. L. and Higgs, J. R. (1997). Barriers to the effective Use of Technology in Education: Current Status. Journal of Educational Computing Research 17(4), 385-395.

Greene, B. A. and Land, S. M. (2000). A Qualitative Analysis of Scaffolding Use in a Resource-Based Learning Environment Involving the World Wide Web. Journal of Educational Computing Research, 23(2).

Harmon, S. W. and Jones, M.(2000). The Five Levels of Web Use in Education: Factors to Consider in Planning Online Courses. Educational Technology 39(6), 28-32.

Hung, D. (2001). Design Principles for Web-Based Learning: Implications from Vygotskian Thought. Educational Technology 41(3), 33-45.

Hung, D. and Nichani, M.(2001). Constructivism and e-learning: Balancing Between the Individual and Social Levels of Cognition. Educational Technology, 40-44.

Javid, M. A. (2000). A Suggested Model for a Working Cyberschool. Educational Technology 40(1), 61-63.

Liaw, S.-s. and Huang, H.-m. (2000). Enhancing Interactivity in Web-Based Instruction: A Review of the Literature. Educational Technology 40(3): 41-45.

Rogers, E. M. (1995). Diffusion of innovations. New York, Free Press.

Rosenberg, M. J. (2001). E-Learning. New York, McGraw-Hill.

Yap, S. (2001). E-learning is new buzzword. The Straits Times. Singapore.

Authors:
Alex C. W. Fung
Department of Education Studies, Hong Kong Baptist University, Kowloon Tong, Hong Kong SAR
Frank H. K. Fu
Faculty of Social Sciences, Hong Kong Baptist University, Kowloon Tong, Hong Kong SAR
W. S. Cheung
National Institute of Education, Nanyang Technological University, Singapore
Email: alexfung@hkbu.edu.hk; frankfu@hkbu.edu.hk; wscheun@nie.edu.sg