INTEGRATING THE STRENGTHS OF THE WEB-BASED AND TRADITIONAL MODELS OF TEACHING

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Abstract: The Internet has revolutionized the way we communicate and created new paradigms for innovation in education. This paper discusses the pedagogical issues conforming to constructivism that educators may consider in the delivery of instruction in post-secondary vocational education. The roles of both the students and teachers must be redefined in the new paradigm. An intellectually exciting learning experience can happen in a classroom, a laboratory or the cyberspace. The art of combining the strengths of classroom face-to-face teaching and Web-based self-directed instruction will be a challenge to educators. In addition to management support and a fair reward system as drivers for improvement, success in the integration of information technology in teaching will rely on teams of teachers who are committed to learning, experimenting, collaborating and sharing their knowledge.

INTRODUCTION

In the past few years, the implementation of Web-based teaching has grown dramatically. Pulled by the demands for lifelong education, many tertiary institutions have become global educational enterprises and distributed their learning programmes to anywhere a telephone line exists. Other institutions adopt Web-based teaching to supplement traditional classroom teaching under the threat that if they are not ready for this new technology, they may lose the best students. Many institutions have realized the need to fundamentally re-think the design and delivery of education for the community, in order to fulfill local community needs as well as the demands for lifelong learning in the global knowledge society.

This paper discusses the pedagogical issues conforming to constructivism that educators must consider if they are to maximize the benefits of Web-based technologies for teaching and learning. Researches indicate that a major reason for past failures of IT projects has been the lack of knowledge and skills of teachers in mastering the tools and integrating them into the curriculum. No matter what strategies or tools we use, the needs of the student must be in focus. We shall share what we have learnt from our Web-based teaching pilot project in which we were given a limited period of time and no additional funding.

THE CONSTRUCTIVIST VIEWS OF TEACHING AND LEARNING

Many scholars describe learning as "that reflective activity that enables the learner to draw upon previous experience to understand and evaluate the present, so as to shape future action and formulate new knowledge." Most education reform programmes in the 90s are rooted in the constructivist theory of learning (Riel and Becker, 2000). **Constructivism** emphasizes that learning is a process of active knowledge construction, not passive knowledge recording or absorption. Learners use current knowledge to construct new knowledge base from direct interaction with sources in the environment. Through social interaction, they actively create meaning out of their individual and group constructions of reality. Learning is context dependent, and highly tuned to the situation in which it takes place.

Reformers advocate a move away from traditional, teacher-centered, didactic instruction, where students are just passive receptors of knowledge, toward more student-centered and constructivist teaching that focuses on inquiry and experimentation. The new pedagogy redefines the classroom as a community of learners in which speakers, readers, and writers come together to define and redefine the meaning of the academic experience (Garcia, 1999). It also redefines the teacher's role as coach and facilitator of learning. The "learning by being told" model of instruction is believed to be not very useful for the active learner. The traditional and the constructivist approaches to teaching are compared in Table 1.

	Traditional Classroom Teaching	Constructivist Teaching
Educational Philosophy	Knowledge Transmission	Co-Construction of Knowledge
Role of Teacher	Delivers information in a structured coherent order	Coach, guide, Learning Community facilitator
Role of Learner	Passive reception of information	Share interests, learning and knowledge with others
Concept of Knowledge	Accumulation	Transformation
Teaching/ learning Process	Association, memorization, conditioning-rewards & punishments	Problem solving, inquiry argumentation, dialog and debate
Assessment Process	Tests of retention of information	Performance portfolios, projects

Table 1: The changing paradigm of classroom teaching. (Adopted from Riel and Becker, 2000 and the Report on Integration of Educational Technology into the Design of Schools for the Future in Queensland (June 1997)).

From a more practical perspective, Chickering and Gamson (1987) describe the essences of good teaching in terms of seven principles of good practice. These seven principles apply equally well to online instruction (Chickering and Ehrmann, 1998). They are given below:

1. Good practice encourages contacts between students and faculty.
2. Good practice develops reciprocity and cooperation among students.

3. Good practice uses active learning techniques.
4. Good practice gives prompt feedback.
5. Good practice emphasizes time on task.
6. Good practice communicates high expectations.
7. Good practice respects diverse talents and ways of learning.

CLASSROOM TEACHING

Classroom teachers who define instruction as the transmission of knowledge have students learn concepts and skills through listening, copying text, and practicing sets of similar problems. Classroom teachers who define instruction as the co-construction of knowledge focus on project activities that expect students to display understanding, interpretation, and original thought.

Riel and Becker (2000) examined the pedagogy of the Teacher Leaders in secondary schools in the United States revealed that the pedagogy of the Leaders was closely tied to the constructivist philosophy. Their classroom activities supported more cognitive challenges, encouraged project work that was extended through time, and encouraged students to work together and to share what they had learned with one another.

Face-to-face contact in and out of class meetings is an important factor in student motivation and involvement. This is particularly true for post-secondary vocational education of youths who enroll in their vocational courses as a second choice in tertiary education. In the absence of any face-to-face interaction, it would be difficult to inspire the unmotivated students so that they feel a desire to learn.

Active learning involves students in the classroom engaging in thinking and interacting with their peers. The teacher has a number of techniques at his/her disposal, such as questioning, discussion, small-group presentations, role plays and case studies.

WEB-BASED TEACHING

The online learning environment enables anytime and anywhere accessibility of teaching materials but technology cannot change the fact that a good course still requires a good teacher. It does not mean that a course will become better simply by putting the curriculum on the Web (Ricketts *et al.,* 2000). Teachers have to exploit the strengths of web technologies and new pedagogies that emerge with alternative ways of communication. For instance, using audio with video can promote engagement of multiple brain channels, resulting in higher retention. Graphical simulations can facilitate understanding of complex concepts. The teaching/learning materials must be functional in addition to accessible. Web-based instruction needs to follow good instructional design principles and conform to good teaching practices and sound Web design principles (Rice et al., 1998).

A pedagogical model of learning by investigation was employed by Badcock et al. (1996) in their project of using the Web to teach fluid dynamics. Rather than simply presenting information, the course was designed to involve the students in the learning process by encouraging them to think about the subject. This was achieved via a question and answer system, which works in this manner: the student is given some information, then asked a question. The student should try to reason out an appropriate answer from a choice of three or four alternatives. The student is given feedback in the form of text with illustrations, video, or animation.

An example of applying constructivist approach in online teaching was described by Downing and Brown, (1997). Rather than simply using the World Wide Web for providing information, students are

asked to develop and review such material themselves in their course on Personality Psychology. Students are required to publish their work on the Web. An email list is used to facilitate discussion. After peer review, the material becomes part of an online course hypertext. The process encourages students to develop their understanding of the topics and gives them the satisfaction of knowing their work is seen and appreciated by a wide audience. Experiences show that students would produce work of higher quality if they know that their work will be viewed by a large audience.

The availability of electronic discussion groups and student assignment work on a teaching web site permits learning take place outside class meeting session. It facilitates peer learning by allowing students to evaluate their performance against that of their peers.

Computer mediated communication technology has simplified the task of creating a Web-based learning environment that would allow learner-content interaction, learner-teacher interaction, and learner-learner interaction. Teachers could focus on the design of learning activities that engage learners in these three different modes of interactions regularly.

Rice et al. (1998) argue that: "creating good Web-based instruction is not simply putting lecture notes online nor is it merely creating a virtual library of links to content related sites. It includes ensuring that good instructional, teaching, content, cognitive, visual, and usability design principles are followed as well as ensuring that it fulfills both teacher and student needs."

THE INTEGRATED MODEL

Combining the advantages of both the classroom and Web-based models of teaching provides an opportunity for enhancing the quality of both on-campus and online distance education courses. The strategy is fully compatible with the constructivist learning framework that associates with interactivity, social presence, cognitive strategies and collaborative learning.

Teaching in an online environment opens up new ways for creative teachers to guide and facilitate learning experiences. Teachers must focus on which learning activities are to be put on the Web and how these activities are integrated with classroom teaching. To decide the appropriate teaching strategies that match learning outcomes, individual learning style and effective linkages between curriculum, pedagogy and assessment remains a major challenge to the teacher.

IMPLEMENTATION OF WEB-BASED TEACHING

There are four disciplines of studies at Kwun Tong Campus of IVE : Business Administration, Computing, Electronic and Electrical Engineering, and Printing. In the past 10-12 months, as a pilot project of implementing web-based teaching, our colleagues dedicated their time and effort on the design and development of courses and modules on WebCT while training was taking place in the meantime. WebCT is a popular online course delivery tool currently used by many tertiary institutions. In addition to posting teaching and learning materials on the platform, some of them explored the functions of online quizzes, bulletins, mail, glossary and chat-room. Students taking Year One and Foundation Diploma in the four disciplines have completed a questionnaire survey to provide data about their current use of WebCT. Small groups of students from these disciplines have been given focus group interviews to invite more specific comments on the platform.

STUDENT ATTITUDES AND PERCEPTIONS

Focus Group Interviews Students find WebCT useful and practical in completing a number of tasks. They can download worksheets, handouts and lesson notes; submit assignments and upload projects; obtain model answers for tests or assignments; and send e-mails to teachers. Some of them also read the bulletin for more information. The CP students particularly appreciate the platform for they can practise what they have learnt on computer knowledge and skills on WebCT. In general, students can make use of WebCT mainly to perform administrative tasks for their modules whereas their exploration of other functions like self-learning, exchanging ideas and sharing information remains minimal.

Yet, some students have complaints regarding the administration of the platform. At the moment, off the campus, WebCT can only be accessed through an external Internet Services Provider (ISP). Majority of the students are reluctant to change their current ISP to another for access to WebCT. They also complained that the speed in downloading was low.

Majority of the students are satisfactory with the present teaching approach of lecture/tutorial/practical sessions together with web-based teaching. One essential remark from students is that an ideal learning approach will be composed of lecture/tutorial/practical sessions to be supported with the web-based instructions for self-study purpose.

Students have made suggestions as to how to improve the management of online courses. They suggested that WebCT should be accessible at home through any ISP for all students. It is of utmost importance that each student has an account in all the modules he or she is taking. The institute should exploit the full advantages of web-based instruction, promote and train students in all the features and functions of WebCT. All the modules should be posted with sufficient and useful materials on the platform, and also be more attractively and colorfully designed with graphics and animation. All the teachers should post model answers for tests/assignments on WebCT. Finally, the institute should provide an area on WebCT for students to post comments and ask questions on IVE matters.

Questionnaire Survey A questionnaire survey has been conducted to evaluate the results of the pilot Web-based teaching project in May, 2000. Questionnaires were sent to 705 first-year Diploma/Higher Diploma students from four academic disciplines of the Kwun Tong Campus. A total of 308 valid returns were received, corresponding to a response rate of 43.7%. The analysis of the data showed that:

- The majority of respondents (56% overall) are willing to spend 1 to 5 hours per week on Web-based instruction (Figure 1) and there are 21% willing to spend 6-10 hours on the same task. However, 6% of the students dislike Web-based instruction and opt for zero hour.

- Students consider that Web-based instruction should occupy about 10% of their total learning time. Figure 2 shows the percentage distribution of average time for various learning activities preferred by students.

- 60.9% of the respondents rate the quality of the learning materials presented in WebCT web sites as satisfactory or better.

- The results of the perceptions of the effectiveness of Web-based instruction are only fair. There are significant differences in the rating of the effectiveness of WebCT in improving learning on a 0 to 5-point scale among the four disciplines. The highest average score for the best discipline is 2.24 while the lowest average score for the worst discipline is 1.56.

LESSONS LEARNED

Staff interviews have been conducted to find out teachers' opinions and suggestions on the implementation of web-based teaching in our campus.

Staff Feedback Except for the Computing Section, only a small number of the staff of the other 3 departments were able to fully utilize the platform for online teaching and learning. Initially, the major reason would be the Computing staff are better trained and equipped in this area of knowledge and skills. Another reason is the lack of computer set-up in the classrooms which seems to discourage web-based teaching and learning in class.

There is a variety of communication tools on WebCT including courses content, bulletin board, private mail, F.A.O., calendar, on-line quizzes, course tools and other useful links.   These features and functions enable the designer to post various types of information on the platform for learners. Without additional resources and support, the teachers have to take up the role of designer for their own modules. Majority of them have uploaded their teaching materials on the course content but are not familiar with the other communication tools of WebCT which requires more learning and practice before one can master them. It is difficult for the teaching staff to spare sufficient time on designing the online course materials in addition to their teaching and administrative workload.

Drawbacks of the Present System Limited accessibility to WebCT both on and off the campus is a major drawback in the implementation of web-based teaching and learning. It was reflected that staff need more support on clerical work and graphic design, besides continuous and systematic training on the tool. Moreover, students need to be motivated and trained to fully utilize WebCT, especially on the tools for exchanging and sharing information on the web, like bulletin and chat-room.

Looking Forward The overall effectiveness of the pilot Web-based teaching project has reached only a fair level in its first year of trial. Looking forward, there need to be measures which encourage and enable students to change their attitude about learning and understand both their own role and the teachers' role in a constructivist approach. We propose the following guidelines for the next phase of the project:

- Provide formal training to students who need detailed instructions on how to use the Web-based instruction tools.
- Plan for learning activities that demand students to use the various communication tools in WebCT for exchanging ideas and sharing information.
- Encourage the production of multimedia-rich contents that facilitate learning.
- Reward staff who are eager to experiment and devise useful Web-based learning activities.
- Continue to provide staff development training in the use of IT in teaching.
- Provide additional support to staff on the production of courseware.
- Identify and disseminate successful practices.

CONCLUSIONS

The Internet has revolutionized the way we communicate and created new paradigms for innovation in education. No matter what strategies or tools a teacher uses, the focus must be student-centred which means learning outcomes, individual learning style and effective linkages between curriculum, pedagogy and assessment. An intellectually exciting learning experience can happen in a classroom, a laboratory or the cyberspace. The art of combining the strengths of classroom face-to-face teaching and Web-based self-directed instruction will be a challenge to educators. In addition to management support and a fair reward system as drivers for improvement, success in the integration of information technology in teaching will rely on teams of teachers who are committed to learning, experimenting, collaborating and sharing their knowledge. The government needs to invest more money on web-based instruction if it wants to see advances in this direction, but should never replace teachers with technology.

REFERENCES

Badcock, K., Littlejohn, A., Baldwin, A., Watt, R. & Robb, M. (1996). A friendly introduction on the Web to fluid dynamics, *Active Learning*, December, 1996.

Downing, T. and Brown, I. (1997) Learning by cooperative publishing on the World Wide Web, *Active Learning*, December 1997.

Chickering, A.W. and Ehrmann, S.C. (1998). Implementing the Seven Principles: Technology as Lever. [Online] Available: http://www.aahe.org/technology/ehrmann.htm Viewed May 9, 2000.

Chickering, A.W. and Gamson, Z.F. (1987). Seven Principles of Good Practice in Undergraduate Education, *American Association for Higher Education Bulletin,* No. 39, March, 1987.

Dempf , S.T., Van der Riet , R.V., Plaag, E.W. (2000). Blending the online and traditional models of teaching: The next paradigm for adult education, CITE Conference, March, 2000.

Garcia, E.E. (1999). Reforming education and its cultures, *The American Behavioral Scientist*; Vol. 42, Issue 6, pp 1072-1091.

Means, B. (1995). Transforming with technology: No "silver bullet." Education Digest, Vol. 61, Issue 31.

Rice, J.C., McBride, R.H., Davis, J. (1998). Defining a Web-Based Learning Environment, a paper presented at SITE Conference, Washington D.C., March 1998. Retrieved May 29, 2000 from the World Wide Web: http://www.byu.edu/ipt/workshops/wbi/text.html

Ricketts, J., Wolfe, F.H., Norvelle, E., Carpenter, E.H. (2000). Multimedia: Asynchronous distributed education-a review and case study, Social Science Computer Review, Vol. 18, Issue 2.

Riel, M. and Becker, H. (2000). The Beliefs, Practices, and Computer Use of Teacher Leaders, a paper presented at the American Educational Research Association, New Orleans, April, 2000.
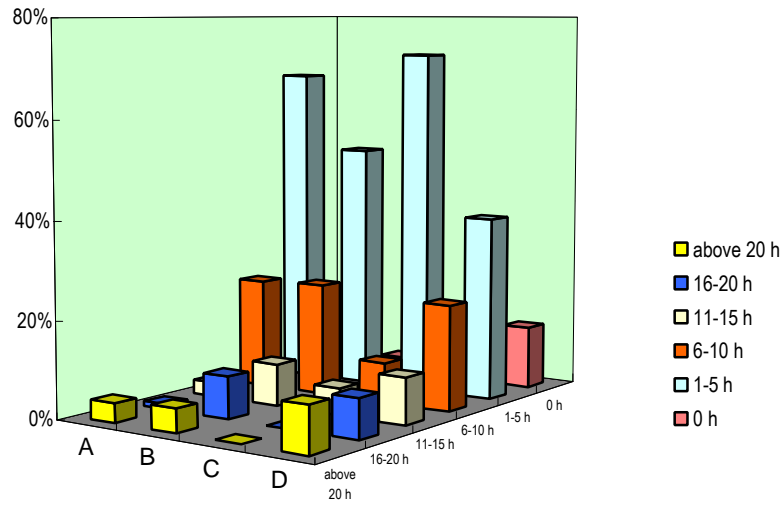
Discipline	above 20 h	16-20 h	11-15 h	6-10 h	1-5 h	0 h
A	4%	1%	3%	23%	67%	2%
B	5%	9%	9%	23%	51%	3%
C	0%	0%	6%	8%	72%	14%
D	10%	8%	10%	22%	38%	13%
All	5%	5%	7%	21%	56%	6%

Figure 1 Percentage distribution of students who are willing to spend on Web-based instruction (categorized by disciplines and hours per week). ($n = 308$)
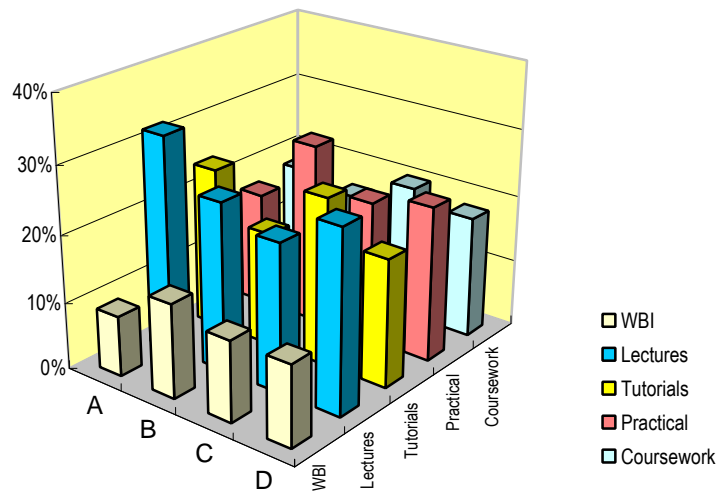
Figure 2 Percentage distribution of average time for various learning activities preferred by students of disciplines A to D. ($n = 308$)

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