

Interactivity in Web-Based Learning: Some Observations Based on a Web-Based Course about CMC in Education

Kwok-Wing Lai
Department of Education
University of Otago
PO Box 56, Dunedin, New Zealand
wing.lai@stonebow.otago.ac.nz

Abstract

This paper documents a Web-based learning environment designed to deliver two distance learning courses at a New Zealand university. It addresses issues related to interactivity and participation in such a learning environment. Learning outcomes of this environment are reported, particularly students were more confident in using communication technologies for classroom teaching as well as for professional development.

Introduction

Increasingly the World Wide Web has been used to deliver interactive distance learning programmes, especially in higher education (Collis, 1997). In fact, if we conduct a search on the Internet we should not be surprised to find numerous Web-supported courses developed virtually in every subject discipline. Clearly tertiary teachers are now facing demands from both administrators and parents in mounting more Web-based courses on the Internet. However, one should be cautious of not jumping onto this Web bandwagon too soon without carefully examining issues of why or how the Web should be used as a delivery mechanism for distance learning. We certainly do not wish to turn the Web into an electronic lecture-notes turner, similar to what many CAI programmes have done some 10 to 15 years ago. To be sure, the Web can certainly be used as a 'conduit' to transmit information but it is not necessarily the best or most productive way of using this medium in education. Also, we should bear in mind of Cuban's (1986) analysis of cycles of technological use in education: that adequate research and planning would be required if new technology is to be successfully utilized. As such, more systematic research should be conducted and disseminated to investigate the design, implementation, as well as pedagogical issues

related to Web-based learning if the Web is to be more widely used as a delivery system.

This paper attempts to contribute to the discussion of the design and the process of Web-based learning. Specifically it addresses issues related to interactivity and student participation in a Web-based learning environment. This paper will first describe a Web-based learning environment developed at a New Zealand university used for the delivery of distance-learning courses. Then it reports on some observations related to issues of interactivity and participation in this learning environment.

Description of the Web-Based Learning Environment

As part of the information technology in education programme of the Department of Education, University of Otago, two Web-based courses were offered in 1997. One of the courses was a full year (26 weeks) upper-level undergraduate course titled *Computers in Education I*. About 100 students have enrolled in this course and they will complete it in November. The other paper was a postgraduate seminar on computer-mediated communication (CMC) in education and was a semester course (13 weeks). Twenty students have already completed this course in June this year. Both courses were electives.

The Postgraduate Seminar

For the purpose of this discussion, the postgraduate seminar is described here in detail. This postgraduate course (*Edux 413*) was a research seminar focusing on recent research and development in Internet- and World Wide Web-based learning. Course contents included: computer networking and teacher education, global interaction in primary and secondary education, computer-supported collaborative learning, computer ethics, and social implications of telecomputing. Until this year lecturing and group discussion have been the dominant modes of course delivery, although in the last three years computer conferencing has become a part of the course. The success of the computer-conferencing component led to the development of a full-fledged Web-based course offered for the first time in 1997 (Lai, 1996).

Of the 20 students enrolled in this course, 9 were female and 11 were male. All except four were part-time students. Prior computing experience was not required to take this course, except that students needed to have regular access to the Internet and be able to send and receive e-mail. All of the students were involved in the field of education, but not necessarily as practicing teachers. Except for one, they were all mature students. The course program included:

- Five asynchronous computer conferences, each lasting for 2 weeks. The conference themes and sub-topics are summarized in Table 1.
- Weekly synchronous chat sessions.
- Weekly reading assignments (both electronic and print-based materials).

- Weekly online exercises (for example, searching online databases).
- Four collaborative course assignments including: (a) navigating the Internet - a hands-on exercise, (b) a conference report, (c) an essay, and (d) a major project.

Table 1. Conference Themes and Sub-Topics

Theme	Sub-topics
1. What is computer-mediated	<ul style="list-style-type: none"> • issues of technocentrismcommunication? • CMC and gender issues • Online persona/culture • Non-neutrality of technology • Summary of conference papers
2. Using CMC in education	<ul style="list-style-type: none"> • Interesting CMC projects • CMC as an agent of change • Online survey - has CMC (or IT) changed your teaching/learning style • Summary of conference papers
3. Designing CMC projects	<ul style="list-style-type: none"> • Experience with CMC • Examples of Internet-based projects • Designing CMC projects • Summary of conference papers
4. CMC and teacher development	<ul style="list-style-type: none"> • Examples of teacher-development networks • CMC and professional development • Using CMC for teacher professional development - what resources to use and how? • Survey on lurking • Summary of conference papers

5. Social and ethical implications

- Censorship of materials on the Internet
- of using CMC in education
- Copyright/intellectual property issues
- Privacy on the Net
- CMC and the future
- Planning our next steps with CMC
- Summaries of conference readings



Design Principles

A World Wide Web server has been set up specifically to deliver this course. *WordStar 2.0* was used on a PowerPC as the HTTP server software, *WebCrossing* was used as the conferencing >

software, an interactive notice board and a helpdesk were constructed by using *NetForm*, and a searchable software database was designed by using *FileMaker Pro* and *Lasso*. This Web-based learning environment was designed to maximize collaboration and interaction among students. It was constructed as:

A familiar environment. Since students taking this course may not be familiar with the World Wide Web and/or distance learning, it is important to construct an environment which is perceived as familiar to them. Thus the 'campus' metaphor was used for navigational purposes (see Figure 1). Once students logged onto the password protected course page (<http://education.otago.ac.nz:800>) they could visit classrooms (i.e., the

conference areas); browse library collections (i.e., the software database, and links to other sources); open filing cabinets (with course materials); check the notice board; and visit the help desk. Students even had their own offices on the site. A decision was also made to integrate conferencing software into the system, instead of using a separate mailing list such as LISTSERV or a newsgroup software for class discussion. The rationale is that once students logon to the site they can do everything onsite, similar to a visit to a university campus. Also, it is believed that as an active learning environment, students should be encouraged to access, search, and select course-related materials on their own and therefore should "pull" materials from the site, rather than have the materials "pushed" to their computer hard drive automatically by mailing software.

A secure environment. Again, because students are new to this environment, it is important to provide them with a sense of security: that they can readily communicate with the teaching staff and get help whenever it is required. This is normally not an issue in the traditional classroom setting as students can always see the staff face to face and raise questions in person. However, in a computer-mediated environment there is a need for the teacher to establish her tele-presence onsite. So in this Web site a notice board was available so that timely announcements could be posted and accessed. There was also a help desk where students could post questions. The help desk was not only staffed by teachers but also by students. This again increased interactivity among students. The staff were also committed to answer their e-mail within 24 hours so that their presence could always be felt by students.

A structured environment. For distance learners, it is important to provide them with a framework to structure their learning. In a traditional mode of distance delivery, such as in a correspondence course, a detailed learning guide is usually provided to guide students' learning activities. On this Web site, weekly learning tasks were scheduled. There was an "Introduction Page" for each week which outlined its learning objectives. It was linked to three additional pages ("What to Know", "What to Read", and "What to Do"). The *What to Know* page gave students somewhat more detailed guidelines of the weekly learning program. The *What to Read* page provided guidelines for the reading assignments and the *What to Do* page outlined the weekly hands-on activities (see Figure 2). The site also maintained a complete set of the course materials as well as links to several local and international databases. A local searchable database allowed students to borrow computer software from the staff. This structure was designed to facilitate sequencing of learning in a systematic fashion.

A student-centred environment. Although a learning structure was provided in this site, it was by no means restricted to students' course-specific learning needs. In fact, this Web-based course was designed so as to encourage students to set up their own learning goals and to explore issues related to computer-mediated communication in education, which were of interest and importance to them. In this way the learning tasks and assignments were designed as flexible as possible and they could easily be tailored to students' own

needs.

An environment owned by learners. The site has been designed to give students a sense of ownership. The provision of *office spaces* to students was an attempt to achieve that. Students were also invited to moderate some of the conferences and hard copies of all the conference postings were sent to them after each conference for record keeping and reference. Students were reminded of their ownership of these postings. To use them for research purposes, permission has to be obtained from them first. Also, one of the reasons why *WebCrossing* was selected as the conferencing software was its flexibility in allowing participants to delete their own postings if they wish.

An interactive and collaborative environment. A major consideration for using the Internet to deliver distance courses is its potential to enhance students' interaction and collaboration. In this learning environment, computer conferencing has been designed as the focus of all the learning activities. Instead of having face-to-face group discussions, students shared their opinions and experience by participating in computer-mediated discussion forums. As students could easily communicate with one another and set up study groups by either using a nickname file or a mailing list, they were required to work as a group to complete their assignments. Interactivity and active participation were facilitated by the following features of the learning environment:

- **Conference Areas.** To provide structured and threaded discussions similar to face-to-face discussions, specific conference areas were set up in this site (see Figure 3). Once students log onto the site they were able to post and respond to messages related to different discussion topics. The five conferences were set up in such a way as to allow different levels of participation. In each conference there was a conference folder where students could post the summary of one of the conference readings of their choice. As well, there was another folder where students could share some of the resources they dug out from the Internet. For those students who were less comfortable about contributing to the discussion at the beginning of the conference, they could still contribute in a less-threatening way.
- **Personal e-mail.** From the site students were also able to communicate with the staff by personal e-mail.
- **People's Directory.** All the students were requested to submit a brief biographical note and a photo to be archived in a searchable database. It was used as a social context for interaction.
- **Feedback Area.** Feedback on student assignments and grades were posted to individual student offices. This area was password protected to maintain confidentiality.
- **News broadcast (Notice Board).** Information about administrative matters related to the course were broadcasted regularly in the news bulletin board.
- **Help Desk.** Students could seek help by posting questions to the help desk. Both staff and students could answer these questions.
- **Chat Room.** A chat room was designed to facilitate real-time communication.
- **A Social Corner.** A discussion folder on socially related matters was maintained to

provide a social context for discussion.



Figure 3: Conference Areas

Did It Work?

Web-based learning environments can be evaluated in several different ways. For the purpose of this paper the present learning environment is evaluated in terms of its process - how effective it was used to facilitate interaction and active participation, and its product - the learning outcomes. Data have been collected throughout and at the completion of the course. Data source includes:

- A detailed activity log.
- A collection of all the conference and chat postings.
- A detailed course evaluation administered at the end of the course. Electronic questionnaires were sent out and those who failed to return them were followed up by telephone interviews. 14 people (70% of the class) either have returned their questionnaires or were interviewed.

Evaluating the Process

Did this learning environment encourage active learning and interaction?

On the questionnaire survey all the respondents considered this learning environment to be user-friendly and there were few technical problems encountered by students in accessing materials on the site. The server log files and the end-of-year survey show that students were quite active in this learning environment. For example, the course homepage was accessed 8573 times within a period of 13 weeks, or about 400 times per student (an average of 30 times per week). In fact, students did work very hard on the course, and, on average, they spent 15 hours per weeks on the course and an average of 6 hours per week participating in the conferences.

When students were asked whether they considered themselves as active learners in this learning environment, more than 75% gave a positive response. They further suggested that reading all the articles, contributing to the conferences, and setting their own goals in finishing the assignments as evidence of active participation.

When the question of whether this learning environment did facilitate active learning and participation was asked, every respondent gave a positive response. The conferencing system and the chat sessions were frequently mentioned in the comments as the key features of the learning environment which encouraged active participation and learning. The structure of the course and the responsiveness of the teaching staff were also referred as factors encouraging active learning.

The conferencing environment

There is no doubt that conferencing has been seen by students as the key component of this learning environment. As remarked by a student, "what would we have done without the conferences? [They] tied the course together and gave a purpose to the readings...you could never have the course without the conferences" (Participant G). When asked whether conferencing was useful in enhancing their understanding of CMC in education, none of the respondents gave a negative response and 58% of the students gave the 'most useful' answer. The average response was 1.7 on a 5-point Likert scale (1 being the most useful).

The usefulness of conferencing was well-expressed by one student:

"While reading Simon's posting regarding the amount of territory (CMC and teacher development) covered - I doubt if this many ideas, or this depth of thought could have been presented in any other media. In FTF [face-to-face] the plot would have been frequently lost along the way, and the side issues not fully explored...the depth of thinking is greater. I'm guessing it is a function of the asynchronous nature of the media, and the suitability of writing for reflecting on thinking" (Participant R)

A further analysis of the patterns of communication of the conferences shows that students have been engaged actively in the discussion. Table 2 summarizes the levels of participation of the students in these five conferences.

Table 2: Summary of Students' Participation in the Conferences



There were 20 students in the course, plus two teaching staff. Of the 20 students, 2 were considered as non-participants as they never contributed any postings to the discussion (one of them was a late comer and did not complete the course). So we can see from Table 2 that in each of the conferences the majority of the students did participate actively by contributing messages to the discussion. It is also noted that there were an increase in the number of postings towards the end of the course as students became more familiar with the learning environment and with one other. A content analysis of the postings shows that they were generally quite well thought out, and were quite lengthy (as compared to messages posted to newsgroups) and discussions were well elaborated and had depth. From my experience in teaching this course in the last ten years, the level of participation of the students and the depth of discussion in this Web-based learning environment were much more impressive than in the traditional face-to-face learning environment (Lai, 1996).

A sub-topic of the fourth conference titled "Using CMC for Teacher Professional Development" was randomly selected as an example of how students communicated in these conferences. Eleven people contributed to this particular conference in a two-week period in May. Following Fafchamps, Reynolds, and Kuchinsky (1991), we can categorize conference postings as islands (messages which have no reply); dialogues (sets of two or more messages where two participants communicate with one another,

similar to face-to-face conversation); and webs (sets of messages which receive more than one reply and responded to one or many messages). As can be seen from Figure 4, the pattern of discussion of this conference could best be characterized as discussion clusters or webs, which was typical of all other conferences. There was a web of messages in

Cluster A (talking about lurking in CMC) not related to the theme and the moderator quickly branched it off to another conference folder. Note that there was not a single island in this conference, which again was quite typical of these conferences.

From Figure 4 we can also see how quickly some of the postings have been answered by the group. On one single day (the last Monday), 8 messages have been exchanged. It is interesting to note that students did not necessarily respond to the last message they have read, indicating that they may have read all the previous postings and decided to contribute selectively to the discussion, as can be seen from the flow of responses.

The following two comments from the respondents highlighted how this learning environment facilitated active learning for some students.

"...The awareness of the learning process when I was having to think new thoughts and to be in the situation of seeing these thoughts and ideas in front of me as they were developing. Like 'genesis in motion'. So many of my thoughts do not see the light of day but in conference mode the ideas are more concrete and permanent than in conversation."
(participant S).

"...the conferences and the topics...gave to me a clue and gave me the possibility to look out for, find out, search, what I wanted to know..." (Participant F).

One also has to note that participation is easily monitored in computer conferencing and thus creates a pressure for students to participate. It is more difficult to hide yourself behind the medium as soon people will notice who has and who hasn't contributed to the conference. This created a demand for response. Also, after each conference, the staff sent an e-mail to all the students summarizing the patterns of discussion and requesting comments. This had an effect on students' participation in subsequent conferences.

Why did some students not contribute to the discussion?

Even though we are quite convinced that the overwhelming majority of students have participated actively in the conferences, some students have been more active than others. It is therefore important to find out why some students didn't contribute as much as the rest if this learning environment is to be improved. The course designer took the opportunity to conduct an online survey in the fourth conference when some students were interested in the topic of lurking in CMC. In this survey 12 students confessed

as being 'lurkers' at some point of time during the course, although they did read the postings and act as 'active listeners'. Lurking was generally described by the group as "passive participation" or "active listening" and it was seen as a valid learning experience. As suggested by one respondent,

"I personally feel I have more to gain from looking and listening and ascertaining 'the lie of the land' so to speak than from jumping in with comments that are going to fill up the peoples mailboxes unnecessarily...people who have a whole lot to say and who can say it well can be very intimidating in this medium" (Participant T).

Figure 4: Patterns of Communication of a Sub-Topic of the Fourth Conference



Confidence

The last comment highlighted the issue of confidence in contributing one's idea to a text-based medium. At least two students confessed that it was because of the lack of confidence that they lurked behind the scene without contributing. The author received the following e-mail message after the first conference from one of the lurkers:

"I didn't actively participate in any of the discussion topics, not

through lack of interest or desire. I did find the conference discussions interesting however I was not quite confident enough to contribute my own ideas. Seeing my thoughts and opinions on the computer screen in the knowledge that others would be reading and judging my very emerging ideas seemed just too frightening" (Participant M).

Indeed, the permanence of the written word was too threatening for some people and they needed reassurance and support in order to contribute to the discussion. After reassuring Participant M that we were all learners and were also new to the medium, she started to contribute in subsequent conferences.

Learning Styles

From the survey and course evaluation it was clear that another reason for the lack of active participation for some students had to do with their individual learning styles. Some students preferred to take more time to reflect on their thinking before they could commit their thoughts on writing. As suggested by one student, participation in a conference was not as easy as one might think as one had to learn how to express one's thoughts in a coherent way so that other people could understand. For another student, it took him until the third conference before he was 'comfortable with being able to...say something', even though he considered himself as an active participant of the course. Very often, by the time he decided to say something, the discussion had already moved on and it was too late for him to contribute. This same participant then decided to post a message early in the next conference, to test whether it would make any difference to his attitude towards the conference, and it did. He then felt more confident about posting further messages and had developed a sense of ownership of the conference.

Some students may rely more on visual cues and body languages for communication and therefore find it more difficult to communication online as compared to a face to face situation. For example, as commented by one student,

"As one of the frequent lurkers I have found it very difficult to actually get on line. I read all the messages and then I think - what can I say? This pattern has made me think about how I communicate and how much I rely on visual cues...just how much I rely and focus on, not on what is being said but all the other messages I am receiving" (Participant S).

Another participant commented at the end of the course that she preferred on-site learning rather than Web-based because she was not a visual learner (Participant W).

Time

The heavy time commitment needed for this course was also raised as a factor affecting students' contributions to the discussion. One third of the students in this course have considered the workload too heavy and as most of them were part-timers, the use of the computer as a medium of communication

imposed a big demand on their time. As mentioned before, on the average, students had spent six hours per week on conferencing. There was a general feeling that conferencing was more time consuming than attending a two-hour lecture per week. Also, as students expected a lot from conferencing, and the conference discussion depended on how well the participants have prepared for it, it took time for students to read all the required readings, reflect on them, and reflect on other people's postings before they could contribute meaningfully to the discussion and follow the threads.

The importance of the moderator

In a computer-mediated discussion, the role of the moderator is critical. The moderator is the one who can nurture the growth of the discussion "by defining the membership of the conference, in keeping the discussion on track, and in scheduling the opening and closing of discussion topics" (Kaye, 1992, p.6). There is evidence to suggest that having a good moderator makes a significant difference in participation (Feenberg, 1987). For example, Robin (1994) reported that when a moderator began to manage the math-science pavilion of the Public Education Network in Virginia, the amount of participation began to increase significantly.

The importance of the moderator has also been recognized as a factor affecting participation in this learning environment. A good moderator was seen as someone who could sustain students interest and keep them online. Four people (two staff and two students) acted as moderators and their efforts were appreciated by the participants. It was the opinion of the class that as long as students were supervised, there was no reason why they shouldn't serve as moderators. One student went as far as suggesting that everyone should have a go. Interest in the topic seems to be an important factor if a conference is to be well-moderated. As commented by one participant,

"... had [the moderator] not been so interested in the topic and reflected so passionately on statements made by others her avid participation would have reduced the level of understanding to be gained from the conference" (Participant A).

Chat sessions

In this learning environment students could chat at any time they liked. However, there was a fixed time slot every week that at least one of the teaching staff was available to moderate and answer questions. Special chat sessions have also been organized on specific topics and external experts have been invited as guest "speakers".

It was commented by the respondents that the most important function of the chat sessions was that they helped build a sense of electronic community and therefore encouraged active participation. As described by one student,

"I think [the chat sessions] help build a sense of electronic community, like this is a group of people and we are all doing this

together kind of thing. So I think for me it was more sort of socialization than task orientation." (Participant B).

Chat sessions also created a social context and a more informal social forum for participation. It was suggested that they should be organised as early in the term as possible.

However, they were not without problems. It was difficult to have serious discussion in a chat session with 15 or more students participating simultaneously. It was found that it was more effective when small groups of students chatted at a specific time.

The chat and conferencing system, as well as the flexibility in time and space have consistently stood out as features in this course which encouraged students' participation. It is therefore not surprising when students were asked whether they preferred the course to be offered online or onsite, nearly everyone (92%) preferred a Web-based course.

Structure of the course

As mentioned before, this learning environment has provided a structure to encourage students to participate in the weekly activities. It was commented by students that the weekly schedules provided them a handle on the learning activities and therefore encouraged them to access the learning environment more frequently. This structure generally served the students well as it maintained a good balance in providing a non-restrictive guidance to learning. As pointed out by one student:

"It seems to me in most courses you either have one of two problems. You either have something which is so highly structured that you just lockstep people through it and the other problem is that you say okay this is going to be very learner directed and people kind of float around going I'm not sure what to do here. So they actually get lost - it is too laissez-faire. And so I think there is a good mixture here where you had your weekly schedules which kind of gave a structure to the whole thing...and also choice for the learners to do things they wanted to do" (Participant B).

Role Modeling

Another reason suggested by the students as affecting their participation was not a structural but a human factor. It has been suggested that because of the enthusiasm of the staff, as well as their efforts to establish onsite presence as active participants early on in the beginning of the semester, has set up a role model for students. And most importantly, their quick response to the demands of the students encouraged students to participate in the learning environment. As commented by a student,

"...the quick response time and the immediate support I felt make it ...very creditable ...that was in effect what made it. If people had to wait 2 or 3 days for a response to an email, I think very quickly that

people would have got disillusioned..." (Participant R).

Evaluating the outcomes

Although it is quite clear that this Web-based learning environment enhanced students' active participation and learning, it is also important to the course designer to see whether it resulted in some positive learning outcomes.

Have the learning objectives been achieved?

When students were asked whether the learning objectives as stated in the course outlines have been achieved, the average response was 1.6 on a five-point Likert scale (one being mostly met) and their expectation of the course was also largely met. In terms of skills and knowledge developed in this learning environment, the feedback from the respondents were overwhelmingly positive. The following comments provided a snapshot of one student's impression of the course.

"from the readings...I have some theoretical and project based materials to base [on]... Because like every institution we are actually starting to get into this thing of 'should we deliver courses on the net' and if so what, and how, and what should be there and why...I can have this kind of running start into a rationale. It is not just the Internet for everything, it is kind of like okay what courses have you got and what do they look like and what interaction do you need to do in order to make it a good learning experience and how could we then support that." (Participant S).

It was pleasing to read the following comments from another participant,

"I had never heard the term 'CMC' used before and now I think I have got a very good idea of what it is and what it is all about. I really think that [the course designer] has certainly structured the course well so that has come across. I have a good theoretical and practical knowledge of it now." (Participant R).

As well, all respondents reported an increase of confidence in surfing the Internet and discussing CMC issues with other people. As reported in the survey, students in general have become more confident in the technical aspects of surfing the Internet, the willingness to set up their own CMC projects, to improve communication, and implement professional-development programme on CMC within their own organizations, as well as using e-mail in their work.

The following comments showed the increase of confidence for another student:

"I really got the confidence to look at setting up an Internet within

the school, not so much running the CMC but also getting email addresses and actually contacting others and getting it all onboard. I suppose in that respect that would be it. There is also the professional thing as well to help professionally." (Participant Y).

Could students apply the knowledge and skills to their workplace?

Then it comes to application. In this learning environment students were encouraged to set their own learning outcomes which were meaningful and useful to their work or study. Students have commented that because of the flexibility of the course work they would be able to apply what they have learned in their workplace. One student who was a lecturer of a Polytechnic was going to use what he has acquired in the course to offer a similar paper in his own institute. Another student has commented that the course:

".. has extended my repertoire of skills with various communication media, reinforced my commitment to being a learning facilitator...I will be promoting CMC as a medium with a great deal of potential. I will also be working with my daughter's school to support them to use the technology" (Participant D).

Change of learning/teaching styles?

A change of teaching style came out quite strongly for those students who were practicing teachers. They realized the importance of being active and learner-centred and were prepared to change their roles in teaching. The following is a typical comment from a teacher:

"I have changed when I think of it. When I next go into a classroom I will want to consider the degree to which I facilitate learning, and the degree to which I foster collaborative learning skills (how to work together etc) and collaborative learning opportunities. I will also be less accepting of courses and staff room situations which operate along more traditional lines... I feel at ease contacting others (such as "important" people) via email (and have done so since beginning this course). " (Participant A)

Another student has made similar comments:

"The readings, plus the experience of working in a learner centred environment have changes my philosophy of teaching and I can feel myself becoming far more radical in my demands for change toward a more learner centred learning environment. ...the breadth of the course and the newness of the media have had a profound effect upon my philosophy and clarified some thoughts that I've had lurking in the back of my mind for a few years now." (Participant R).

The question of whether CMC has changed the participants' teaching/learning styles was also raised in

one of the conferences and seven people responded to the discussion. Of the two respondents who were experienced computer users they commented that the technology definitely has changed the way they taught, and it was a gradual and long-term process. Both of them suggested that because they had to learn alongside with their students they became more 'human' teachers and their students viewed them more as fellow travelers, rather than as authorities of knowledge.

Working on this CMC environment changed people's learning styles as well. For example, one student reported that using the medium made her more focused on how she learned. Because the information processed was all in written form and was permanent two students felt that they were more conscious of what they wrote and would think more about what they had to say.

Discussion and Suggestions

From the course evaluation there is no doubt that this learning environment has been well-received by its participants. It has been quite clear to the course designer that the Web has been a good medium in delivering a paper on computer-mediated communication. The same conclusion was echoed by a student:

"It seems appropriate that a course on CMC uses CMC as its medium of instruction. Everything we have done [has] involved the essence of the course: communication. Summaries of conference readings were posted for others to read, conferences themselves involved CMC to discuss aspects of CMC and so on. The "tour" of CMC has also involved some heavy-duty surfing and emailing which provided practice in those skills while acquiring knowledge." (Participant A).

This course has been designed for those people who were interested in using computer and communication technologies in education. However, there is no reason why other courses should not be offered on the Web, as long as this medium's potential of maximizing interaction and communication has been recognized and utilized.

How to encourage participation in a Web-based learning environment is an important issue to consider. Based on my observations, there are several suggestions:

1. Sorting out all the technical and management problems in the beginning of the year. The technical requirements of accessing and contributing to the learning environment should be made as user-friendly as possible. In designing a course, it has to be assumed that all students are Internet illiterate. In our learning environment, the only communication skills required to take the course are the abilities to send and receive e-mail. Technical support in various forms (for example, telephone, in person) should always be provided, especially in the beginning of the term. Also, it is not a trivial matter to let students know that their presence has been made known to the staff and the required course materials have been delivered to the students on time. Making sure that all the students are on track is a huge management task but needed to ensure participation.

2. Creating a social context for interaction. A social context has to be created for the participants as early as possible. This context is useful in encouraging reflection and contribution to the conferencing environment. A photo which appears next to a conference posting is a great help (in the survey it has been mentioned as a useful means of 'socialization'). A participants' directory should be available as should an informal chat area which provides some informal social interaction. Some students in our survey suggested occasional video and/or video conferencing at the beginning of the term as a useful means of providing a context for social interaction.

3. Fostering a sense of ownership of the learning environment and developing an online culture. Students in a distance learning network could easily be marginalized. Fostering a sense of ownership is essential if participation is to be maximized.

4. Preparing for the conferences:

- Make sure students have prepared for the conference by reading all the assigned readings first. The discussions should be literature-based.
- Avoid a conference being dominated by just a few people. It is intimidating to more timid members of the class.
- Limit the size and number of postings per student. Long messages won't help, but will put off people ("the messages that were several pages long just switched me off totally" (Participant C)). Single-page posting perhaps is the optimal size. Anything more than a page students have to print it out to read which will cost time and money.
- Post early, don't wait. Perhaps make it compulsory that everyone has to contribute a message on the first day of the conference, it will help develop a sense of ownership of the conference as well.

Conclusion

Designing a Web-based learning environment is a complex exercise. It should begin by considering issues such as whether a course is suitable to be delivered by the Web, both in terms of its curriculum and contents, as well as its technical feasibility. This paper has only focused on some issues related to the process of interaction in a Web environment and shows that the Web could be used to promote interaction and participation and foster desirable learning outcomes.

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Biographical Data

Dr. Kwok-Wing Lai is a senior lecturer at the Department of Education, University of Otago, New Zealand. His main research interest is on the use of computer-mediated communication in teacher education and professional development.

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