

Chapter 17. Creating a FirstClass Learning Environment

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1. Introduction

This evaluation project focuses on an online learning environment established for postgraduate students studying an Open and Distance Education Specialism in the Masters in Professional Education and Training Program at Deakin University. Online conferencing has been progressively used in this specialism and was an integral part of the program in 2000, with students studying online in five units throughout first semester. All units have computer conferences established with FirstClass software for electronic discussion of ongoing tasks and activities with the aim of engaging students in learning interactively. Our participation in the CUTSD project confirmed most of our approaches to teaching and learning online though as a result we are beginning to modify strategies in response to student feedback and our analysis of evaluation data. The action evaluation model helped us to change evaluation processes during the study while encouraging us to consider approaches to evaluation other than those used in the project.

2. Background

There is considerable evidence (Smith, 2000; Stacey, 1998) that interactivity and collaboration are important and necessary components for the successful construction of knowledge and meaning from resource based learning, particularly in distance education modes, including online. Teaching through the use of online conferencing (such as FirstClass), which enables student to student and student to teacher interactions to occur in asynchronous as well as synchronous modes is recognised as providing an enriched context for learning. Computer mediated communication (CMC) technology has helped to remove the isolation of learning at a distance for off-campus students and enabled distance students to interact regularly with

other learners and their lecturers in virtual campus environments (Stacey, 1999). Help and feedback can be easily available to students remote from the campus, through the use of online communication. Students can raise questions and receive replies and suggestions from their lecturers and other students. Researching the type of learning that occurs in such an electronic environment has become increasingly important in helping us understand the most effective ways of using online technologies in tertiary programs. It has also provided a need for understanding the most effective learning strategies for students who are studying online.

Using CMC with distance learners was seen from the early days of its introduction as having the potential to change the nature of distance education. Mason and Kaye (1990) predicted that CMC use would develop a potentially new type of learning community that would provide a space for collective thinking and access to peers for socialising and communication. This prediction is being affirmed in the widespread use of computer conferencing in tertiary programs (Evans, 2000; Naidu, 1997; Oliver, 1999). Stacey's research (Stacey, 1998, 1999) has shown the importance of group collaboration in learning and her discussion of computer mediated communication, from a social constructivist perspective, has focused on interactive online group discussion as central to the learners' effective construction of new conceptual understandings. Her research found that in the social context of group interaction, the collaborative group develops a consensus of knowledge through communicating different perspectives, receiving feedback from other students and teachers and discussing ideas, until a final negotiation of understanding is reached. Drawing on Vygotsky's (1978) theory that conceptual understandings are developed through verbal interaction, Stacey found that a socially constructed learning environment is

essential for effective learning. The social conversation provides the learner with a context and stimulus for thought construction and learning which is the means by which the group contributes more to each learners' understanding than they are able to do individually.

3. Online Learning in Open and Distance Education Units

The Open and Distance Education course has been using computer conferencing since 1993 to teach courses and support distance students (Stacey, 1997, 1998). Conferencing was established as an attempt to provide interaction for students and break down the isolation of their distance learning experience. It was also a medium under research in distance education and as such was a way of providing students in this field with a means of analysing its use and

medium. Students are required to use the FirstClass environment to communicate and to access and share resources, both those provided and those they have researched and evaluated through searching the World Wide Web. They moderate discussions about issues of online learning, and work in collaborative groups for an assessed task on researching the theory and process of collaborative learning online. Another unit, *Media, Text and Technologies in Open and Distance Education*, also requires online interaction (which constitutes part of the assessment), though extensive print resources also support the unit.

- A third unit in this project was *Critical Issues in Open and Distance Education* which required posting tasks to the conference for discussion and which structured two main discussion points in the semester as well as other informal

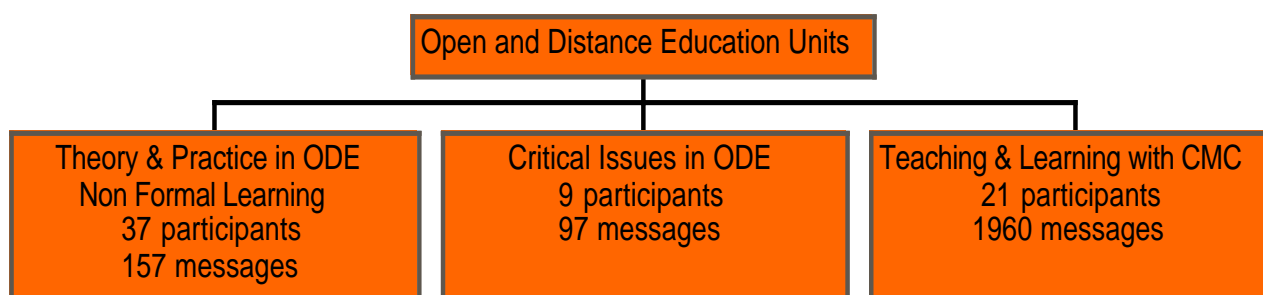


Figure 17.1. Continuum of Online Activity.

effects on distance education. Since 1995, the electronic conferencing software, FirstClass, has enabled the establishment of a virtual campus in the Education faculty for most students studying postgraduate coursework degrees and higher degrees by research (Stacey, 1997). Postgraduate students studying in the Open and Distance Education specialism use computer conferences as their main communication process for group interaction and their use has been integrated into our teaching in a range of ways. This can be seen as a continuum of interactivity and intensity from required intense interaction to some online task requirements to no required online presence.

- At the most intensively interactive end of the continuum is a unit about theory and issues of technology and teaching in open and distance education called *Teaching and Learning with Computer Mediated Communication*. This was developed in response to students' growing interest in the theory and practice of teaching in a virtual

discussion.

- *Theory and Practice in Open and Distance Education and Non Formal Learning* encouraged online interaction but had no assessable requirements for online interaction.

Though we have previously used the online environment to discuss and reflect on the evaluation comments of the students learning in this environment, both formatively and summatively, no overall attempt had been made to rigorously evaluate the online learning processes¹ and learning outcomes² in this specialism. The acknowledgement of the need for this

¹ *Learning processes* refers to all cognitive activities that contribute to learning, (e.g. problem solving, reflection) as well as the manner in which these activities are carried out (e.g. individually, in groups, teacher or student-directed).

² *Learning outcomes* refer to the things students are able to do as a result of their engagement in a course of study. This includes both discipline-specific and generic skills.

prompted our participation in the CUTSD funded project.

4. Description of project

This evaluation project focused on aspects of the implementation phase of the learning-centred framework adapted from Alexander and Hedberg (1994) and Bain (1999). In respect to the analysis and design stage, curriculum analysis indicated that opportunities for off-campus students to interact and engage in discursive activities were limited, therefore knowledge construction was often an individualised endeavour. FirstClass conferencing was adopted to address this problem for reasons outlined earlier.

The development phase did not centre on technology development: it centred on the development of the FirstClass learning environment which provided opportunities for students to discuss issues, debate points of view, modify and/or fine-tune conceptual understandings in ways that were not practicable before CMC was available. It was also essential that students studying technology should be engaged in using it routinely.

Formative monitoring of this environment focused on the scale of the technical and support structure needed (Goodwin, Rice, Stacey & Thompson, 1995). This work demonstrated that students found FirstClass easy and enjoyable to use. It reduced the isolation so often felt by off-campus students and made them feel part of a community. Providing the technology infrastructure was stable, a majority of students found it easy to access resource materials and carry out the required discursive activities. Over 80% of students believed that CMC facilitated their learning through small group teamwork processes, though at this stage, no other data was gathered to affirm these beliefs.

Therefore this project was designed to evaluate the effects of the use of computer conferencing on students' learning. During the semester, data were gathered electronically, using the methods described below. The project used qualitative methods to gather students' perceptions and reflections on the effect the conferencing process has on their learning. Quantitative data was collected through

analysis of the frequency and type of messages which occur on the conferences. Final student results for the units were also reviewed.

5. Objectives of the Technology-facilitated Learning Environment

- To establish a computer conference which provides a dynamic environment for active, interactive learning.
- To structure the online learning experience so that students most effectively use the computer conference to write, reflect, communicate and learn.

6. Objectives of the Evaluation

At the implementation phase, this project was designed to investigate:

- the effectiveness of the way computer conferencing has been incorporated into the units by comparing different levels and patterns of online interaction and learner response to these differences.
- the ways in which the learning processes and learning outcomes of the students studying the described units were affected by the use of computer conferencing.
- the effects of differently designed online learning environments on student interaction and learning

7. Research Questions

1. How is computer conferencing used in teaching and learning for sharing ideas and constructing knowledge?
2. How is conferencing interaction used by the students in the unit?
3. In what ways have the lecturers in the project's units structured their unit activities and assessment to use the computer conferences?
4. How have the students responded to the differing requirements to communicate online?
5. How have students perceived the effect of online interaction on their learning?

In Table 17.1, evaluation objectives, research questions and methods are aligned with formative and summative evaluation processes relating to the implementation phase of the learner-centred framework.

Table 17.1. Evaluation model.

Learner centred Framework	Objectives	Research questions	Methods for all questions
Implementation:			
Summative evaluation of learning process	To investigate the effectiveness of the way computer conferencing has been incorporated into the units by comparing different levels and patterns of online interaction and learner response to these differences.	How is computer conferencing used in teaching and learning for sharing ideas and constructing knowledge? How is conferencing interaction used by the students in the unit? How have the students responded to the differing requirements to communicate online?	Voluntary focus groups Online observation Assessment analysis Message frequency
Summative evaluation of learning outcome	To investigate the ways in which the learning processes and learning outcomes of the students studying the described units were affected by the use of computer conferencing.	How have students perceived the effect of online interaction on their learning?	Voluntary focus group Summative online discussion
Summative evaluation of innovation appropriateness	To investigate the effects of differently designed online learning environments	In what ways have the lecturers in the project's units structured their unit activities and assessment to use the computer conferences?	Online observation - retrospective analysis Future planning

8. The Evaluation Model

Because this evaluation study draws on both qualitative and quantitative data gathering methods, it is consistent with the Eclectic-Mixed Methods-Pragmatic Paradigm described by Reeves (1997). This approach recognises the complexity of interactions within discursive environments in education and the chaotic nature of variables. It also recognises that evaluation is a human construct, a sociopolitical, collaborative, divergent process that yields unpredictable outcomes (Guba, 1989). However, the mixed-methods approach accepts the pragmatic need for studies that manage the complexity of educational settings and allow for some generalisable data.

Because of the need to summarise and analyse discursive data, the major emphasis of this evaluation has been on interpretive, qualitative

approaches such as those described by Patton (1990). However, there was also a need to quantify particular categories of responses to determine how widespread they were. The gathering of usage statistics and response frequencies was used to test the credibility of comments and provide opportunities for triangulation of data.

The teaching team were the evaluators of the project and though this meant they could be responsive to student comments in a formative way, the evaluation was ultimately a summative evaluation of the implementation phase of the computer facilitated learning (see Table 17.1). This meant that, as prescribed by ethical requirements of the university, most of the evaluation analysis occurred after the semester was complete and grades were recorded so that participants were able to respond in an open and unpressured way.

Table 17.2. Geographic distribution of student group.

	Vic	NSW	Qld	Tas	SA	WA	ACT	NT	NZ	Other International	Total
Capital	8	9	3	0	2	3	1	2	2	2	32
Country	17	10	3	1	0	0	0	1	2	3	37
Total	25	19	6	1	2	3	1	3	4	5	69

9. Project participants

Students were invited to volunteer for the evaluation project through the MPET unit electronic conferences on FirstClass. There was potentially a group number of 69 participants. The students were all studying off campus and were geographically distributed over every state of Australia and in New Zealand, the United Kingdom, Korea, Fiji and Vietnam (see Table 17.2). There was a slightly higher number of students living in rural and regional areas of Australia but despite the range of geographic distribution, internet access was not a major problem in this study as it had been at the time of the 1995 evaluation of the analysis, design and development phase of CMC use (Goodwin, Rice, Stacey & Thompson, 1995). It did affect a small sample of the participant group, for example one student in New Zealand was unable to access the FirstClass conference mainly due to her institution's firewall provision, and email was her main source of communication with her class. Also, some students who were unable to participate online failed to successfully complete their unit assessment. However lack of participation online could mainly be attributed to the course requirements and when online interaction was required for assessment, students became active participants.

The participant group had a higher proportion of females than males and a higher proportion in the 40 to 50 year age group (see Table 17.3),

studying part-time while working full time. These demographics reflect the population of students studying at Deakin's Masters level in the Education and Training field. Online learning offered them group interaction more conveniently than studying on campus and enabled the widely scattered Australian and international group to gain access to university study in a way that overcame their distance from the Deakin campus.

10. Methods for Data Collection from Participants

1. Voluntary focus groups were established online. Students were requested to respond within electronic conferences established specifically for the project. Questions about experiences, learning online, and reflections about online practice were posted in this area for student response at both formative and summative points in the semester. As not all students seemed willing to post comments publicly, these questions were also emailed to those who had not participated in the focus group conference.

2. Online observation of communication and learning processes through ongoing response to student comments with retrospective analysis of conference message archives used to analyse communication and learning processes. This involved calculation of frequency and distribution of message use, and some representative analysis of conference message content to determine strategies used by students in their learning processes online.

Table 17.3. Age and gender distribution of student group.

	20-35	36-40	41-45	46-50	51-55	56-60	Total Group
Female	8	3	15	13	5	6	50
Male	0	4	7	6	1	1	19
Total Age Group	8	7	22	19	6	7	69

3. Analysis of relevant student comments within assignments in two units in which the first assignments were designed to encourage reflection on the online teaching and learning process and are relevant to the focus of the research project. This data was used as formative feedback but with the large accumulation of similar data through the other collection methods, was not used as a main source of qualitative data. Instead the early analysis of results led to the fourth data collection method, an online discussion.

4. Summative online discussion held three months after semester ended in which all participating students were asked to comment on a summary of early analysed findings which were posted on a short term computer conference set up for this purpose.

The Action Inquiry/Evaluation model (Phillips, 2000) of plan, act, describe, review was a process the team used and the originally planned evaluation methods and schedule changed as the evaluation progressed. After the initial focus groups were set up, it became obvious that this was not a way all students wanted to report their reflections. Following a review of progress, the use of assignments (already used by one team member) was recognised by two members of the team as an important contribution to the students' reflective data and plans were made to save a commentary from that source. The team also decided that using the medium under evaluation, a special computer conference, would be a suitable way to gather evaluation data in an interactive discussion. These changes required more ethics committee approval (which had already been gained at the end of the semester's teaching so that there could be no sense of misuse of the teacher's assessment power in gathering student comments) and the project slowed from the

original planned schedule. However it did mean that the final online evaluation discussion was a form of reflective practice online as students consciously discussed the already analysed results of their focus group answers.

11. Analysis of Results

The project studied a total of 69 students over five units. Of the total group, 30 students participated in the online focus groups throughout the semester, distributed as shown in Table 17.4.

The *focus group* evaluation responses showed that the majority of students had been using the Internet for a few years and were often self taught or had had little formal training. Many used computers and online communication in their work and as a resource base for information. Computer conferencing was new to most students and some students noted that learning to use the FirstClass conference was a new process for many of them which initially made them feel insecure and uncomfortable. They thought that a structured process of learning steps was helpful at the beginning of a course. Most saw the potential of the online conference as an interactive interchange of ideas between participants.

The following results will be described in relation to the research questions.

1. How is computer conferencing used in teaching and learning for sharing ideas and constructing knowledge?

The students in the most interactive online courses were appreciative of the required interaction as a way of making them engage more actively with the content of the course. It enabled them to construct their own

Table 17.4. Distribution within evaluation project.

Continuum of interaction requirement	Required online semester interaction	Required online tasks	Interaction encouraged not required
Total students = 69	22	9	38
Total focus group participants = 30	18	2	10
Total conference messages = 2214	1960	97	157

understanding of the course content with feedback from other participants to assist that construction.

"...it provided me with the opportunity to construct my own knowledge/understanding within my own context. Meant I had to revisit readings, interpret what others were saying in the group, respond, evaluate." Female student, <50, international.

The different perspectives provided by the different students was particularly seen as an advantage to their learning as it took them out of their own more limited view of the subject (often with difficulty).

"Yes as it brought other people's perspectives to the issues raised which wouldn't occur by completing an assignment alone. our group had participants from England, Korea, Melbourne and Alice Springs which all had a wide range of diverse views and experiences in education." Male, 50, rural.

In the most interactive unit students found that the other participants challenged their ideas and provided new thinking.

"I was forced to think laterally and compromise my preferred style of learning. It forced me to take my blinkers off and open my mind to other interpretations. At first I was intolerant of other opinions that did not mesh with mine. Seeing words in black and white in front of you seems a lot louder than a voice." Female, >50, rural.

"..extended me in new areas, made me think about what I was saying and then had to rethink it when others took it differently. Gave me not only one experience but the experience of many to look at issues." Female, 40, international.

Often students compared online learning and face-to-face learning, judging CMC as more engaging and flexible environment for their learning.

"I had to really nut things out in order to feel confident in discussing things with the other members of my group. Putting your thoughts down in written form seems to require much more

effort than face-to-face discussions." Female, 35, metropolitan.

"It challenged me to think about the questions and people's responses - CMC has certain advantages over the face-to-face tutorial in that here we often get EVERYONE'S response to a question - in a face-to-face class you would probably only hear from one or two people and then the tutor. CMC allows more reflection than in the face-to-face setting - we have time to read each other's comments and respond to them in our own time. We can come back to something later and respond to it - these opportunities rarely exist in face-to-face classes." Female, 35, rural.

"Had more time to think through the issues as there was no need to respond immediately. Often went back and reread materials to clarify issues and having this bank of materials readily available was helpful." Male, 50, rural.

The ability to "benchmark" their learning, to find out how others learned online was another advantage not always possible at a distance.

"Something interesting to me that did emerge was an understanding of how others think and work at a Masters level. This is the first time I have been able to observe peers at work, their commitment, their depth of involvement, their professionalism and actual research and language skills." Female, 40, international.

2. How is conferencing interaction used by the students in the unit?

Overall the majority of participants found FirstClass use for online learning was enjoyable, easy to use, responsive and reliable and that conferencing was a positive experience. They thought that conferencing partially overcame the disadvantage of distance education in not being able to discuss things with others and that in their busy lives there was an advantage in the flexibility of access and times of study. They described how the group communication in the developing online community provided a motivation for

learning and how they enjoyed the interaction which reduced their usual isolation in distance learning. They had a sense of community, particularly in the sharing of resources.

"I worked really hard, much harder than I am working on my present course because I felt a connection with my peers and felt I owed it to them to be on top of the conversations, contributing when I could and commenting on their thoughts when needed." Female student <40, capital city.

The shared resource base was seen as a great advantage of this type of learning as web resources have increased to such an extent that a group process of research and commentary on web sites provided students with a much better resource base than they could find themselves.

"The contributions from various others broadened the pool of resources to check and utilise. I was continuously grateful for the excellent resources offered by group members. I was able to access many valuable readings due to the industriousness of my colleagues. My own resources were okay, yet I found that sharing this task of finding materials gave a varied edge to the readings." Female, 40-50, international.

In the units where there were no structured tasks, students found that maintaining a focus on the unit and its issues through the conference was very useful as it stimulated their thinking and new ideas and raised different issues. Students thought that early orientation towards the unit was facilitated by online discussion and that online participation was a useful discipline.

One student summarised the advantages of interacting in an online environment as:

- sense of learning community
- discipline of regular feedback/responses to FirstClass
- quick feedback from colleagues in the group
- quick & easy access to Tutor
- one place to go for group contact
- less expensive than attending university campus
(male >50, metropolitan WA.)

3. In what ways have the lecturers in the project's units structured their unit activities and assessment to use the computer conferences?

The introductory description of units and the continuum of interaction (Figure 17.1) showed the differing assessment of interaction that was required of students and the consequent rate of participation that occurred. The analysis of online observation that follows also showed that even when participation was not central to content discussion the social interaction and support enabled by CMC was used by the students. The role of the lecturer as conference facilitator, regularly interacting online was seen as essential to maintenance of activity and focus by students in all units. How this role could be established and the effects of modeling online communication strategies are described in the second content analysis described below.

"The quality of the interaction is also affected by the frequency of the lecturer. Another site I attend has no lecturer involvement and the site feels "less relevant and important." Female >50, international.

"The lecturer/ tutor has the ability to encourage and expand the learning base of all students when there is regular dialogue among the group." Female, 50, metropolitan.

4. How have the students responded to the differing requirements to communicate online?

A comparison of message frequency and student results provided inconclusive evidence of the effect of online interaction on learning outcomes. Because of the differing requirements of the units for online interaction, students in the units not requiring interaction were able to gain high grades with few or no messages, as the conference was not central to the course content or discussion. In the units that required online interaction, there was a trend for frequent interaction to correlate with high message frequency, though this message tally gave no indication of the quality and length of the messages.

In the units requiring online interaction, the most interactive students were also the most successful with only one very interactive

student receiving a Pass level while all other frequently participating students gained a grade higher than a pass. All failing students in all of the 5 units had also failed to interact, their absence online reflecting their lack of engagement with the course through group interaction with feedback from students and staff with a consequent lack of submission of assignments resulting in failure. Only one student had failed to complete the course after an interactive start and this was due to external work related relocation.

From the student responses through *online discussion*, the students with structured online interactive tasks reported working harder than in other distance subjects as they were accountable to the group and engaged more with reading and reflection on a wider range of resources than they would have consulted alone. They were unable to just do the minimum amount of work for the assessment when they were asked to contribute to an ongoing discussion. The students from the course with fewest online requirements saw the value in structuring discussion questions. Those with fewer interactive requirements and less experience still thought that social learning interactions are only partially, and rather inadequately, replaced by online participation and they were dubious if online was the sole medium of delivery.

12. Online Observation and Analysis

The differing requirements for online interaction in the five online courses resulted in a wide range of message frequency (see table 17.1) as well as in differing message content. The archives of conference content were used for two differing studies of content analysis by two of us in the project team. In the first analysis study, learning strategies of students were analysed through the use of a previously developed framework and in the second study, a focus on the social presence factors involved in establishing highly interactive conferences was explored.

12.1 Analysis 1

The group interaction in the following two units of study was not structured by the lecturer. There were no set tasks or questions for students to address; and contributions to the electronic conference were not part of the assessment of the unit. The teacher introduced

broad areas of discussion and guided the interactions, and maintained constant interaction with students. The discussion was intended to allow participants to select their own issues for discussion, and for those issues to be pursued through interactive discussion.

Because interaction was not required, the number participating was much lower, (half the students in one course of 10 students participated and one third of the larger unit of 28 students participated). These results reflect most postgraduate students' limited time for study which confines them to participating in only required and assessed tasks, but the smaller conference content provided the lecturer teaching the courses with a manageable body of data to analyse. He applied a previously developed framework (Marland, 1992) to analyse the learning strategies of the students through message analysis. Each student contribution generally contained a number of identifiable strategies. In identifying the strategies, a record was also kept of their frequency of use. These frequencies were then categorised as:

- Strategies used frequently
- Strategies used infrequently
- Strategies not used at all

Finally, an analysis was undertaken of some of the deficiencies in the strategies identified in the original framework. Some strategies needed to be more finely defined than originally appeared (see Table 17.5) since there are different uses made of the same strategy. Additionally, some new strategies have been identified.

Analysis 1 results

The frequency of use of each strategy is shown in Table 17.6 with commentary below:

Frequently used (more than 5 occurrences):

The Linking strategy was used in some different ways. First, students linked discussion and concepts to their own experience. Second, they made linkages to examples they had read or imagined; and they also linked the experience of others to concepts being discussed.

New strategies identified:

A number of new strategies were used by students identified in Table 17.6:

Table 17.5. Categories and definitions of learning strategies (Adapted from Marland, Patching and Putt, 1992b, pp17-18).

Strategy	Definition
<i>Recalling</i>	brings back into working memory an idea, opinion or fact previously stored in long-term memory
<i>Confirming</i>	judges that ideas in text support own beliefs, practices, tactics
<i>Generating</i>	formulates own questions, examples, ideas, problems; interpolating; going beyond the data
<i>Diagnosis</i>	identifies strengths and weaknesses in ideas, strategies, points of view
<i>Translation</i>	expresses segments of text in own words
<i>Categorising</i>	sorts items, ideas, skills into different classes or groups
<i>Imaging</i>	creates a mental image of an idea in text to gain a fuller understanding of it
<i>Application</i>	considers the use of an idea or tactic in a different context
<i>Linking</i>	associates or brings together two or more ideas, topics, contexts, headings, personal experiences, materials, tasks
<i>Cognitive monitoring*</i>	thinks about, reflects on, evaluates or directs own thinking
<i>Strategy Planning</i>	plans ways for processing or handling textual material during training sessions
<i>Evaluation</i>	makes judgements about the value of textual materials, activities, in-text questions, own position or point of view
<i>Selection</i>	identifies key material, gist material, or that which is relevant to assessment
<i>Deliberation</i>	engages in thinking about a topic, segment
<i>Rehearsal</i>	repeats ideas, facts etc. two or more times to facilitate recall
<i>Anticipation</i>	predicts or states expectations that problem, question, textual feature etc. will be encountered; looks forward to new material; wonders about the possibility of an event or occurrence in text; relevance of material, content
<i>Comparing</i>	identifies similarities or differences between two statements, concepts, models, situations, ideas, theories, points of view etc.

* named 'metacognitive' by Marland, Patching and Putt (1992).

Table 17.6. Frequency of Strategy Use.

Frequently used > 5 occurrences	Infrequently used 5 or <5	Not used	New strategies identified
Analysis Generating Application Linking Comparing	Recalling Diagnosis Translation Categorising Imaging Cognitive monitoring Deliberation Anticipation	Strategy planning Evaluation Selection Rehearsal	Social strategies: Introducing Strategy Encouraging Strategy Information sharing Other resources: Sharing resources Response to others Sharing in imagining a resource Administrative questioning

- Social strategies - these included students using strategies aimed at introducing themselves to the group, and providing background and context information on themselves. Also identifiable was a deliberate strategy on the part of some students to encourage another student by remarking on the value of a contribution made. The 'Introducing Strategy' was frequently used; the 'Encouraging Strategy' was used infrequently.
- Other resources - a frequently used strategy not identified in Table 17.5 was the sharing of information about other resources. This strategy took three different forms:
 - The sharing of information about a resource a student had identified;

- Response to others' suggestions of a resource;
- Sharing in imagining a resource that did not exist, but that would be useful.

Frequent use was not made of these individual forms of resource strategies but, in collection, the strategy was used frequently.

- Information sharing- this was a strategy where students shared knowledge they had gained from experience. The strategy was not used frequently.

A further, but infrequent use was made of the electronic conference to ask questions of an administrative nature.

The First Class discussion was largely confined within itself. Students did not often make reference to the course materials, nor discuss reading material provided in the course. The discussion generated itself, and was confined to the content of the discussion as though it had a life separate from the assessment and the course materials. Students had a common focus in discussing the area of study covered within the Unit, but tended to keep that discussion as a conversation about the topic, without connecting it specifically to the course. It is suggested that is due to the unstructured and non-assessable nature of the electronic discussion. A departure from that general observation was in one of the two courses, where students have to complete a large number of small and reflective tasks, rather than two sizeable essays, there was some cognitive monitoring undertaken by students as they shared their experiences in achieving the completion of the tasks. This was not, however, frequently used.

12.2 Analysis 2

The second analysis was researching the most interactive online course in which interaction

and collaborative online resource sharing were required. The more intensive requirement for interaction in this unit was analysed focusing on the way the teacher established a model of social interaction through use of social presence factors. The level of cognitive engagement was also analysed particularly through the continuing patterns of interaction and communication when students began to work mainly in small collaborative groups. This analysis used a categorisation that labeled units of meaning within each message for its primary purpose and content into:

Cognitive/content, detailed discussion and commentary on the course content.

System messages (relating to learning the FirstClass software, or access issues) and administrative messages.

Social content analysed into social presence factors using the multiscale Social Presence categories developed by Rourke, Anderson, Garrison and Archer (1999) for defining and measuring social presence in a computer conference. The 3 additional categories, with twelve indicators, are:

- **interactive responses**, threaded responses with messages of socially appreciative nature;
- **affective responses** expressing emotion, feeling and mood which are expressed by emoticons, humour and self disclosure and
- **cohesive responses** which are group responses which build a cohesive group environment.

The total group of 17 participants in this course interacted online and generated 1281 messages. The conference analysis focused on the development of social presence as a modeled and learned process. The first month of the main introductory conference was the space where students were asked to introduce themselves to the group and where the whole group established their online relationships before breaking into small groups. A period of

Table 17.7. Social Presence Factors.

Social Presence	Affective units	Interactive units	Cohesive units	Total
Week 1 Students	31	29	33	93
Teacher	4	13	18	35
Total	35	42	51	128
Week 2 Students	55	117	57	229
Teacher	2	14	3	19
Total	57	131	60	248
Week 3 Students	15	20	16	51
Teacher	1	6	4	10
Total	16	26	20	113

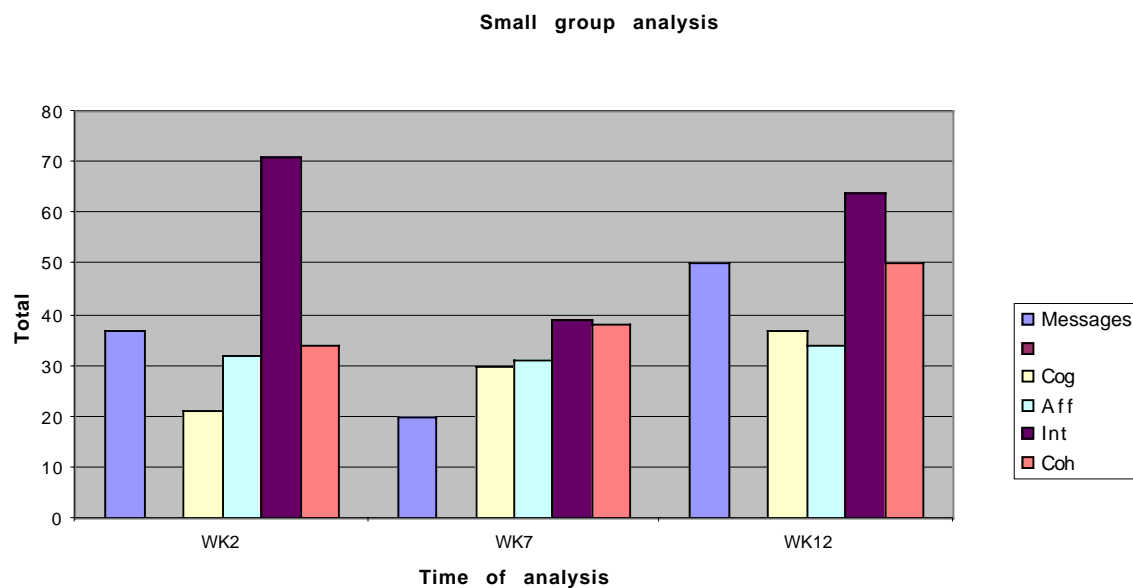


Figure 17.2. Content analysis of small group interaction.

the first four weeks of semester was analysed (Table 17.7) as well as two later periods (weeks 7 & 12) when small group conferences had been developed (Figure 17.2).

The teacher's role in the first week of semester, establishing a secure learning environment and modeling socially accepting processes of interaction, was shown to be a major factor in increasing the frequency of social presence factors in the whole group conference, as students in the second week of semester followed teacher direction and practised using aspects of the software while providing personal contextual information (see Table 17.7). The rise in the level of social presence factors in week 2 was obvious and could be explained because though the student participation rate did not vary from the other weeks analysed, their messages followed the modeled and explained process for establishing social presence.

When small collaborative groups were established in this unit to continue group discussion and tasks, the social presence factors continued to be important in the communication of the group, with high frequencies of interactive and cohesive units particularly continuing to appear within messages and even rising towards the end of the semester (see Figure 17.2). Even though cognitive content became a main focus in the group's interaction, the social interaction

continued to be an important factor within a less formal space. As group participants negotiated over content, they interacted with one another's message text, asked questions and agreed with and complimented the others' ideas, an important social component of effective collaborative and cognitive learning.

The differing strategies of online interaction employed by the teaching team established the effects of required online participation and the role of the teacher in establishing these requirements and in facilitating and modeling the interactive mode of communication.

5. How have students perceived the effect of online interaction on their learning?

Most students recognized the value of this although a few students elected to work independently on their assessment. They did identify the increased time spent on the subject as a disadvantage though this was an element that the students usually saw as a choice and as a self-management issue. Some distance students complained that they chose to work at a distance as they preferred their independence and the ability to work at their own pace and did not learn well in groups, though they could still see the advantages of the medium in their learning.

In the *summative online discussion*, which was set up for all participants in all the courses

to discuss the focus group evaluation results and to give their final comments, 16 students (9 female, 7 male) and we three teachers participated in the month long conference which generated 94 messages, 59 of which were from students. The discussion occurred 3 months after the units under evaluation had been studied and the project participants had taken other courses which had been taught in a variety of ways, both with and without computer conferencing. This resulted in some comparative reflections which were a rich source of data. Overall, the whole body of students were very positive about the results reported and saw many advantages in learning online and raised some useful issues for improvement.

These included discussion of access problems particularly in rural areas, how this was being responded to and the issues it raised:

"It's good of the NT Govt to be so committed to technologising. But as with many developing nations, the existence of infrastructure isn't the whole story. For remote Aboriginal communities, there is increasing access to online facilities, especially in schools, council offices and clinics, but these are really the preserve of white people. Elsewhere there are issues of security and maintenance for expensive computer equipment, access to people who can service computers, and particularly the issue that pretty much all of the exciting stuff on the net is in major world languages, like English, which is a hindrance to many in these communities." Male >50, rural Northern Territory.

A need was identified for proficiency in English to fulfill teachers' expectations of reflective and deep thinking expressed in messages. A need for print material to backup online reading was desired as it provided flexibility for learning away from the computer.

Issues such as differences in gender participation were raised and discussed. One female student analysed her group's interactions and stated:

"I found that the men were more inclined to divulge references and links to good sites than "chat" informally. I felt that there was less of a banter and

more of a statement made when the men participated." Female, 35, metropolitan.

The men agreed with this comment to some extent though they also appreciated the social support of the online conference. One suggested we should experiment by removing names and interacting:

"to see if people do decide gender from the tone/language/style of FirstClass messages or respond or contribute differently if gender is not apparent from the FirstClass message texts." Male, >50, metropolitan.

Issues of establishing social presence and the need for other additional communication technologies layering the conferencing such as phone, meeting, or synchronous chat, was seen as essential for avoiding misinterpretation of messages. An ongoing need for teacher presence was supported unanimously with the lecturer's interaction seen as essential for a conference to be effective.

There were still some students who were unconvinced that online learning suited their style of learning or that the online discussion was worth the effort it required. Some students chose distance education because it suited them to study independently, so required online interaction was not perceived as an advantage.

"I had to force myself to contribute on a regular basis - however I would have preferred to be a lurker." Female >45, rural.

"I still haven't gotten the feeling that the time I put into conferencing is bringing me greater returns in terms of understanding and community (and whatever) than I would get putting that time into something else. I participate to give it a chance." Male, >40, rural.

Some thought it was hard to challenge ideas online, as they tended to be cautious of appearing confrontational. However, the majority of the students were convinced that conferencing was worth the effort, with the responsibility and accountability to the group helping their learning and engaging their interest while teaching them resource access skills.

"Having feedback is a motivator in itself, it's wonderful to have people acknowledge your ideas, you feel less isolated and bouncing ideas off one another is an important way to learn. Different experiences by people can either confirm or allow you to question the views you may have on a certain topic." Female, >40, international.

13. Conclusions

The main findings of the evaluation have given the teaching team an insight into how effectively computer conferencing has been incorporated into the postgraduate units and how well students are learning this way. The different responses expressed by the learners to the different requirements for online interaction, as well as the effects on the learning processes and learning outcomes of the students have been analysed using a range of evaluation methods. The structuring of the units and their effects on interaction and learning online have been carefully analysed. In summary we found:

- Student feedback supported the use of online conferencing in encouraging a learning community with teacher presence seen as central to this being established.
- Frequency analysis showed that required online involvement generated high frequency of messaging, a high teacher time requirement that needed more management with responsibility given to students. Patterns of communication showed that high teacher interaction encouraged high student response but in small groups this was devolved and required less teacher interactivity.
- Tasks designed for online discussion generated online interaction with a cognitive focus.
- Both content analyses pointed to the role and importance of the conferences for social interaction and administrative sharing as well as for a cognitive focus.
- Summative discussion was a key evaluation innovation and confirmed previous findings establishing the reliability of formatively gathered results.
- Students perceived the value of considering other students' perspectives, ideas and resources as a major component of their successful learning online.

The involvement in the CUTSD evaluation project was an impetus and support for our team in evaluating and researching our computer conferencing in a rigorous and detailed way. The multiple methods of evaluation meant that we were able to triangulate student's individually expressed perspectives with content analysis and frequency statistics. A final summative discussion of results confirmed the results gathered which gave us a great deal of insight into how effectively computer conferencing had been incorporated into our courses and the ways these differing uses were affecting student learning. The role of the teacher in structuring and establishing cognitive and social presence of students studying online was defined more clearly and the cognitive and social strategies students use to learn online are already impacting on the way we are revising and writing new courses in our postgraduate program.

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