

BREAKING DOWN THE BARRIERS: DEVELOPING ONLINE COMMUNICATION IN AN OFFLINE ENVIRONMENT

¹Robyn Benson and ²Lesley Hewitt

¹Distance Education Centre, Monash University, Australia.
email: robyn.benson@dec.monash.edu.au

²Department of Social Work and Human Services, Monash University, Australia.
email: lesley.hewitt@art.monash.edu.au

ABSTRACT

When the acquisition of professional expertise is founded on understanding human development and facilitating social functioning, interactive opportunities for the exploration of relevant issues, and the practise of relevant skills, provide an invaluable part of the learning process. For distance students, the availability of computer conferencing systems offers the potential of providing some of these opportunities cheaply, conveniently and effectively. However, in circumstances where computer literacy is low, the barriers created by access difficulties (both in relation to the availability of equipment and to the use of the software), lack of technical expertise and associated problems need to be addressed in the context of the potential benefits.

This paper describes the trialling and evaluation of a computer conferencing system with a group of undergraduate social work students, where structured tutorial tasks were provided for students who were able to participate online. Other students were provided with an offline alternative. The paper highlights the problems experienced by the online students (and those who intended to participate online but were unable to) and some suggested solutions for dealing with them. However, in particular, it outlines the benefits available to those who overcame the barriers, not only in terms of student support, but also in terms of the pedagogical gains resulting from a guided collaborative learning experience. Task responses indicated the value of the experience for developing analytical and negotiating skills which were fostered by the need to evaluate different viewpoints and modify arguments in response to the contributions of others.

KEY WORDS

Social work, distance education, online communication, collaboration, access, equity.

1. INTRODUCTION

This university has offered a Bachelor of Social Work degree by distance education since 1989, thereby providing access to social work qualifications to many people whose opportunities to study are otherwise limited. For the most part students have studied using print materials complemented by a three day residential workshop each semester, together with a minimum of 28 weeks of fieldwork as stipulated by the Australian Association of Social Workers.

Given that interpersonal skills are integral to social work practice, a potential disadvantage of print materials has been that they have not easily lent themselves to the development of these skills while students are actually studying the course content. Teleconferencing has not been introduced because of cost factors and though there has been some use of videotape for skills

development, this does not allow for direct interpersonal engagement. A further issue has been that the use of an assessment system based primarily on a limited number of written assignments, has resulted in indications that a small number of students are not interacting with the subject material itself, via the readings and activities provided, to the extent and at the conceptual level expected of them.

It was for reasons such as these that a decision was made to trial the use of computer mediated communication (CMC) with second year students studying a subject entitled *Social Work Perspectives on Human Development*. The potential for overcoming both pedagogical and communication barriers by computer conferencing was enhanced by the availability of WebFace, a World Wide Web-based communications facility developed for distance education students and available on the university's computer system. However, it was recognised from the outset that benefits in transcending some barriers would be countered by the creation of others: all of the students, and the staff member teaching them, had limited computer experience, and student access to adequate computer facilities was also an issue: it was known that some social work students did not even have access to a regular and reliable electricity supply. To weigh up the benefits and disadvantages it was decided to build a WebFace component into the subject in order to trial and evaluate the system, but also to provide an offline alternative to aspects of the subject addressed by online communication, in an effort to equitably accommodate all students.

The remainder of this paper describes the trial and the evaluation in order to comment on whether the elimination of barriers to learning afforded by online communication compensated for the creation of others.

2. IMPLEMENTING ONLINE COMMUNICATION

Prior to the implementation of the WebFace trial a survey of students enrolled in the subject was undertaken to establish how many had access to the computer facilities for participating online (a modem, a telephone connection, adequate power supply and an IBM compatible PC able to run Windows 3.1, Windows 95 or Windows NT). Twenty-four of the 60 students responded positively. In order to gain a realistic indication of its value, it was felt that the WebFace component, or its alternative, needed to be an integral part of the teaching and assessment arrangements, an issue noted by Yeatman and Stace (1997) and Stacey (1997) in comparable situations. However, consideration also needed to be given to the inexperience of the online students and the inability to duplicate exactly the online requirements for the offline students. Based on these circumstances, the following arrangements were made.

Amongst the activities provided within each topic of the printed subject material, one was identified as a 'designated activity'. Online students were initially divided into four tutorial groups of six and were required to discuss the issue/s raised by the designated activity within their group, with time allowed for discussion extending one week beyond the semester week/s allocated for each topic. Offline students were asked to write a response of 250–300 words, submitting the responses for three topics at a time by specified dates. Responses over the nine topics formed 60 percent of the final grade for the subject for both groups of students, with the remaining 40 percent relating to a written assignment.

Assessment criteria for online students were identified as: use of the subject material, personal experience and the views of others in presenting a point of view; clear and logical presentation of ideas; and development of ability to critically analyse issues, including the appreciation and evaluation of different viewpoints. Students were asked to provide at least two or three contributions for each topic, with each contribution being a maximum of two screens in length. They were advised that shorter, more frequent contributions would often be more effective in facilitating discussion than longer, less frequent offerings. Assessment criteria for offline students were the same as those for online students, excluding the integration, appreciation and evaluation of other viewpoints. Both groups of students were asked to be relatively spontaneous and informal in their responses in contrast to the way that they would present an essay.

The decisions which led to the arrangements for the online students were informed by a number of considerations. At a general level, as indicated earlier, the technology addressed several issues which were relevant to the particular situation, offering educational benefits of the kind summarised by Bates (1995), including the development of academic discourse, allowing for collaborative learning, knowledge building and maximising the knowledge and experience of all participants, development of reflective writing skills, and overcoming isolation. This last attribute was particularly applicable given the geographically dispersed situation of the students, and when it could be combined with the potential pedagogical benefits of creating a situation where ‘... each participant in a discussion builds on the contributions of others, and where, a new synthesis of ideas ...emerges’ (Kaye, Mason & Harasim 1989, p.35). However, it was also recognised that advantages of decreased isolation, increased motivation and student-centredness might be countered, at least initially, by high anxiety levels from a number of sources: the stress of adult students having to perform in an unfamiliar situation (Brundage and Mackeracher, 1980); the potential impact on the self concept of computer anxiety (Stubbs and Burnett, 1994); communication anxiety relating to the online environment (Feenberg, 1989); and the requirement to produce assessable work. This placed considerable stress on the moderator (herself inexperienced) to provide support, as well as acknowledgement of the potentially heavy workload involved. Of particular assistance in planning the WebFace component were the practical guidelines provided by Harasim (1991) on designing and managing the online environment. Some of her hints on Netiquette and online writing were included in the students’ printed subject guides.

The need for early establishment of electronic access (Stacey, 1997) was also recognised and at the residential workshop preceding study of the subject a one hour tutorial was held for participating students to introduce them to the concept of computer conferencing and to provide introductory information for connecting to WebFace, with a view to giving them at least four weeks to become familiar with the system before the semester began. They were also provided with the printed guide to WebFace (which included installation advice and a self-help tutorial on conferencing services) and a CD-ROM containing support software for use if they were not already connected to the Internet. However, delays in receiving Login IDs and passwords removed this potential advantage.

Subsequently, 10 of the students withdrew from online participation, and one withdrew from the subject, leaving 13 students who participated in the CMC component. Students were then reallocated to one of three tutorial groups (two groups were amalgamated after the third week when the number of withdrawals became clear). There were four students in two groups and five in the third group. All students who undertook the online component were female (approximately 10 percent of students enrolled in the subject were male).

3. EVALUATION ARRANGEMENTS

Evaluation involved the following steps.

1. The 13 students who were participating online were emailed a questionnaire containing open-ended questions asking them about: problems experienced and if, how and when they were solved; positive experiences; the usefulness of CMC in general and WebFace in particular; and comments and suggestions to assist in future offerings.
2. The 10 students who had intended to participate online but were unable to do so were mailed a questionnaire containing open-ended questions which asked them for: reasons for withdrawal; what could have been done to allow them to stay in the system; and any other comments. They were also asked to indicate if they were interested in and available for following up their comments by telephone.
3. The subject adviser was interviewed and asked similar questions to those asked of participating students (problems, solutions, positive experiences, the usefulness of the system) as well as advice for staff who were considering using CMC for the first time.

4. The staff member at the help desk was interviewed for her perspective on the nature, extent and timing of problems experienced by students, the assistance required, and suggestions for reducing problems for future new students. The WebFace Project Officer, responsible for implementing the system, was also asked similar questions in relation to the issues that had been referred to him.
5. Content analysis of all of the above responses was then undertaken and each contribution was categorised as a problem, suggestion or comment.
6. The contributions of the participating students were analysed using the typology developed by Mason (1991).

4. EVALUATION RESULTS

Responses were received from 10 of the 13 students who participated online and six of the 10 students who intended to participate but did not do so, as well as from the staff members indicated above.

4.1 ONLINE STUDENTS

The problems identified by the online students were categorised as follows.

1. Access to and use of newsgroups (8 students)
2. Secondary problems (6 students)
3. Connecting to WebFace (5 students)
4. Inexperience in communicating via computer (4 students)
5. Help desk issues (3 students)

Although half of the group had difficulties in connecting to WebFace (the main problems being insufficient instructions for connecting when already connected to the Internet via an Internet Service Provider (ISP) other than Monash, or when using Internet Explorer rather than Netscape), the major area of difficulty mentioned related to accessing and using the newsgroups. Problems included inability to find or subscribe to groups, send or receive messages (including losing whole or part of messages or sending them to the wrong place), send or receive attachments (one student sent an attachment with a virus which infected another student's system), and problems in accessing newsgroups when connecting via an ISP other than Monash, even after successfully opening WebFace.

Many of the connection problems, and those related to accessing and using the newsgroups were solved with the assistance of the help desk, though in the latter case solutions were often found 'by accident'. However, there was concern about insufficient preparation by the university and about the fact that the WebFace guide did not adequately address the two major problems encountered in connecting to WebFace, thus confusing students who were trying to use it to solve their problems.

The problems listed as secondary were those which were contingent on the primary task of connecting to WebFace and interacting in the way required. The most frequently mentioned of these was cost, including the cost of connecting to the Internet at STD rates or of paying for technical assistance or modification to equipment (or repair, in the case of the virus recipient). Other problems mentioned were frustration at the delays involved in solving the primary problem/s, and lack of confidence.

The four students who referred to inexperience in developing the kind of discursive interaction which the online component was intended to provide, indicated initial difficulties in posting contributions as comments for discussion rather than as individual presentations. (One student actually referred to the process as assignment submission.) An associated problem was that students often did not begin to contribute until late in the period designated for the topic, leaving less time for discussion to develop. This problem became less significant as students developed confidence and experience and also as a result of the participation of the subject

adviser in leaving and posing questions to facilitate discussion. Suggestions for alleviating the problem in future included setting two time lines (one for the first message to be sent and a second for making replies) and organising tutorial groups at the residential workshop so that group members could 'break the ice face to face, rather than chip away at it slowly online'.

Although most comments regarding assistance provided by the help desk were positive, three students referred to limitations in this area: limited help desk hours meant that assistance was often unavailable when needed; information given was not always correct or was not compatible with the system used; and calls were not always returned.

Eight students made additional suggestions to improve the experience of future students, a number of them referring to limitations of the WebFace guide. As well as improving the guide, suggestions included provision of a further guide specific to the subject studied, provision of hands on classes at residential workshops, or extra screen prompts.

In their comments, students responded very positively to the CMC experience, though there were a few reservations about WebFace itself. It was notable that even those students who had quite strongly negative experiences in establishing contact were enthusiastic about this form of teaching and learning. Comments particularly referred to the benefits of collaboration in reducing isolation, increasing motivation and improving learning, while one student referred to implications for the profession, and another to the access and equity issues.

Some examples follow.

It has been excellent for me to help me keep up with my reading as I have a tendency to slack off as I have other things to do, or lose enthusiasm. Having to e-mail each week or fortnight has been a great motivator. The other good part is having some contact with others and being able to discuss your ideas in an organised way. Perhaps even better than tutorials because every one has plenty of space to have their say ... I think it is an excellent way of allowing distance education students to keep in contact with each other and keeping them on track with the subject when they are not at the university.

... I find it extremely useful to read other people's opinions and ideas. It broadens my knowledge and helps me know if I'm on the right track, especially with the tutor's feedback. This also means feedback can be given to a whole range of topics, not just for one or two assignments. One of the problems with being a distance education student is isolation and it's great having contact with others. Writing weekly notes is probably more time consuming than just keeping up with the reading but it does make me think more deeply about the material I have read.

Oh, after the second time I used it I decided I wished all my subjects were on line and once I had mastered how to post rather than mail then it was fine ... In terms of DE, it is a brilliant medium for reducing isolation, getting prompt feedback from the lecturers and sharing with peers. I have really enjoyed it, and it has been the reason I am not behind in this unit this semester ... I have found it a great way to study and really appreciate it. I think it has also taken the stress out of the unit as it's quite a big unit ... Oh ... this has been excellent, really tops, especially for my learning and peer sharing. I honestly feel like I've been 'at' the university with this unit ... I would recommend this to anyone and would prefer it if all my subjects were on line.

This mode of learning is one way of overcoming typical problems of the DE mode. I have also found other professionals are ... very interested in this mode of delivery and are starting to give more credit to the course in general because of this. Social work is an interactive course and the best way to overcome distance and the lack of tutorials is teleconferencing and computer conferencing. This component has also broken some of the isolation normally felt as a DE student which has been a growth experience. Once the technical aspects get handled better, then I think this mode of teaching is THE way to go for a lot of the subjects that normally require interaction and discussion!! ... To me this component has really improved the quality of the course.

I think it has the potential to be an excellent tool for open, flexible and distance learning. As well as enabling the consolidation of learning through discussion and debate, it offers an informal peer support network, allowing students to share ideas, information, problems and concerns. It was particularly useful in that it enabled messages to be sent privately to an email address, or to be posted publicly in the discussion groups. [However], I think there are some very real issues relating to access and equity that need to be addressed before it is introduced compulsorily. These issues relate to students who are geographically remote, on low incomes, have poor access to reliable power supplies, or who are not confident in the use of technology. ... Overall, I have genuinely enjoyed being a part of the online tutorials, and I look forward to any similar opportunities in the future. I fear that even with my limited use of the opportunity, I have become addicted to the convenience and speed of this type of interaction. It is also of great benefit just to be reminded that there are other people out there in a similar position to myself. I would also like to thank [the subject adviser] for her bravery in taking on so great a challenge, for her understanding and patience in coping with our difficulties, and for enabling us to be a part of an exciting and valuable step forward into the future of DE.

4.2 OFFLINE STUDENTS

The problems identified by the six students who responded, and who had intended to participate online but had not done so, were categorised as follows.

1. Difficulties in connecting to WebFace (4 students)
2. Computer access (3 students)
3. Help desk issues (3 students)

The inability of these students to continue related either to circumstances affecting computer access (one had access to equipment after hours only and, being unfamiliar with the Internet, found this insufficient to get started), or the inability of the help desk to assist them in resolving their problems. Nevertheless, one stated 'I believe it to be a great system and hopefully continues'.

Improvement to the help desk facilities was the major suggestion for assisting future students. This included improving staff knowledge of the system and extending help line hours, particularly for the first week or two. Suggestions on other issues were similar to those made by the online students in relation to providing a hands on tutorial and improving the WebFace guide. Other ideas were to warn students about the degree of expertise needed to participate online and to provide a list of names and telephone numbers of online students studying the same subjects so that they could ask each other questions. Currently students have a list of others studying the same subjects but no way of identifying who is an online student.

4.3 SUBJECT ADVISER

The WebFace experience was also the subject adviser's first experience of teaching via computer conferencing. Her main problems are summarised as follows.

1. Workload
2. Use of WebFace
3. Organisational and communication issues
4. Help desk issues

Managing the workload was difficult because of part time employment, inability to access WebFace from home because of security arrangements on her home computer, unfamiliarity with the system, and the time consuming nature of the moderator role (about two hours per week for 13 students). Receiving and commenting on responses of offline students was an additional responsibility which was also less interesting compared to the exploration of issues through dialogue which increasingly characterised the responses of the online students.

As for many of the students, the difficulty of connecting through a local ISP, and the fact that the WebFace guide did not provide instructions for this, caused initial problems. In addition, some aspects of the system did not always operate smoothly and limited awareness of or ability to implement some features (such as threading and sending private emails) contributed to a perceived need for more training.

Delays in students accessing the system, and in knowing who was participating, led to difficulties in the tutorial groups' initial functioning. Withdrawals left the four groups of six uneven and it took three to four weeks to realise that some students were not intending to participate. There was then a further delay in amalgamating smaller groups because the WebFace Project Officer was on leave and no one else had this level of access. As a result, the deadlines previously set for discussion on individual topics did not work and students in the smaller groups had particular difficulty in establishing dialogue and needed more assistance. Even in the group that was working well:

the first time they were formal – almost in isolation. Now they're much more informal and responding to each other's comments and going off and developing lines of argument, but that did take some time to develop.

Nor did students respond to related issues placed in general newsgroups in an effort to extend their interactions beyond their tutorial groups.

Despite the considerable assistance provided by the help desk, there were nevertheless times when solutions to problems were not available. A further problem was that as the subject adviser and the staff member operating the help desk both worked part time, delays in gaining assistance were experienced: to achieve synchronous assistance both had to be working at the same time. However, the role of the help desk and also the WebFace Project Officer had been invaluable:

... not just their helpfulness but their attitude has been very positive: very tolerant and very patient ... there is never a sense that this is a stupid question or I should be able to deal with this one and I think that is really encouraging because if you're not treated [in this way] you will make more use of it.

Suggestions again included the need for improvements to the WebFace guide and for hands on training (in this case for staff). Concern about the need to improve access of and assistance to students was noted, through strategies such as the loan of modems and the designation of telecentres (or other local centres) for advice.

In relation to teaching, the experience had underlined the importance of: seeking early confirmation of whether or not students are participating online; keeping activities simple (one question rather than several questions); setting timelines ('because they keep people at it') but being flexible; and including activities in assessment because of their motivational features. However, in spite of some problems with the system, the use of CMC had met expectations in relation to teaching and learning. It provided greater understanding of what students were learning (which also had value in relation to the offline students as it heightened awareness of their grasp of the materials as they completed parallel activities) and their interaction with each other had improved their interaction with the subject matter:

It certainly seems to be meeting what my concerns were with the DE students which were that I had no idea that they were reading the course book material as they went or whether they were just doing the assignments ... it certainly seems to have broken down the isolation that they feel and it does allow me to get more of an insight to how they are reacting to the material ... the motivational value is another factor.

In addition, it allowed participating students to use the opportunity to come to grips with the technology. However, the justice and equity issue remained a concern: '... can we and should we demand that students have access to technology? ... it would be a lot easier for me if more had the technology.' It would have been easier to cope with all 60 students online 'because I wouldn't have had all those activities [from the offline students] to read'. Many students who did not participate had computers but not modems.

4.4 THE HELP DESK

The main problems dealt with by the help desk were as follows.

1. Connection difficulties
2. Use of newsgroups

In addition to the problems mentioned by the students and subject adviser, were the initial delays in receiving passwords and login IDs from the Computer Centre, which would have allowed students to work on connection issues before the semester began. Further problems were related to the fact that it was not possible to ensure that students with private Internet connections had all the software they needed, though in most cases those who had difficulty in accessing newsgroups just had to be shown the steps involved.

The main help desk suggestions were to make some parts of the WebFace guide more explicit and to include in it a contents page for immediate reference to problem areas. In relation to the part time operation of the help desk, it was felt that there was no need to have the help desk manned all day as long as someone checked messages in the morning.

4.5 WEBFACE PROJECT OFFICER

The project officer responsible for the operation of WebFace again listed connecting to the Internet and use of newsgroups as the main problems which students experienced. He emphasised the importance of good help desk support in solving connection problems and the importance of staff training. However, he considered that the best form of staff training was open to question as people learn incrementally - by doing - and thus an important factor is to provide a safe environment to make them more at ease about asking questions. He noted that the subject adviser and students who participated had gained a lot of experience which would allow them to develop further, despite being the 'least computer savvy' of the groups who had used WebFace so far.

4.6 MESSAGE ANALYSIS

There were 272 messages sent by the 13 students and the subject adviser. Messages were focused on each of the nine designated activities that corresponded to the nine topics in the subject materials. Based on the typology developed by Mason (1991), the messages were analysed for the following components. The percentages indicate the proportion of the interactions which dealt with each component.

Introduction of new issues for discussion	22.4%
Comments on others' opinions (both students and subject adviser)	21.1%
Use of personal experience related to subject theme	19.6%
Other characteristics	15.1%
Reference to appropriate material outside the subject materials	8.3%
The subject adviser acting as facilitator	7.7%
Summaries of previous messages	3.6%
Students posing questions for the group	<u>2.3%</u>
	100 %

There were 531 component parts to the 272 messages sent by the students and subject adviser, with more messages related to the first three designated activities compared to the other six (38–43 messages per activity compared to 17–33). However, a large number of these early messages were categorised as 'other' and included introductory comments about the students and concerns and queries about the use of WebFace. These kinds of messages decreased after Topic 3 as students became more familiar with using WebFace.

In contrast to Mason's 1991 study, all of the students made online contributions (which was to be expected given the role of participation in assessment and their awareness of the CMC trial). No student dominated the tutorial discussions. All students except one posted more than one message per topic.

The assessment criteria had specified that the students' work would be assessed according to: their use of the subject material, personal experience and the views of others in presenting a point of view; the clarity and logical presentation of their ideas; and their ability to critically analyse issues. Students responded to the activities in ways which demonstrated that they had met these criteria. All students made extensive use of the subject material, including the prescribed readings, though use of material outside these sources and their own experience was limited. The extent of the subject adviser's role as facilitator varied across the groups. It was considerable in the early stages, and with the two groups which were initially small (only two students) and which were amalgamated after Topic 3. Participation was smaller in the largest group where a high degree of group cohesion developed quickly among the students. It is worth noting that individual personality characteristics of the students, and the group dynamics which developed, had an impact on group interaction, just as they do in face-to-face tutorial groups.

5. DISCUSSION AND CONCLUSION

It was clear from all sources included in this survey that the primary focus for improving the WebFace experience in this subject (and, potentially, others like it) needed to be on facilitating connection to the system and access to the newsgroups. Once these initial problems were solved there was no doubt about the positive response to CMC, and the opportunity was provided for appropriate interactions to develop with experience. If staff and students are able to operate the system, even minimally, the groundwork is laid for increased awareness about and introduction of more sophisticated uses of the technology, and for maximising the number of students who are likely to have access to it.

To justify the time, effort and organisation involved in streamlining access to the system for novice computer users the potential benefits in terms of pedagogical advantages and student support need to be weighed up against negative aspects such as staff workload and the access and equity issues. In this case, for those students who succeeded in accessing the system the benefits of the collaborative experience seemed clear, even despite the difficulties and costs involved. While there was room for the pedagogical benefits to be developed further (in areas such as posing questions for the group, summarising previous messages, and including reference to additional material) the progress from the previous use of the print materials was noted by the subject adviser (even in the serendipitous effect created for the offline students). She, too, while acknowledging the workload involved in CMC moderation, responded to the motivational aspects of the interactions while benefiting also from the reduction in workload as the groups became established.

Thus, despite the barriers that new technologies inevitably create for some students, there is no doubt about the value in overcoming them to break down not just technological barriers, but social barriers and other barriers more central to the learning process itself. For isolated distance education students the benefits are especially rewarding. The concern is for those students, albeit potentially reducing numbers of them, who are left on the other side. It would be counter-productive to introduce impediments to participation in a course which was created to improve access for students. However, the view has been taken, as a result of this project, that the benefits of computer mediated communication justify the continuation of efforts to remove the obstacles for those who face them, as long as efforts are concurrently made to parallel, as closely as possible the online experiences for the offline students. While the offline experience cannot be the same, in terms of student interaction, the role of the subject adviser in more closely monitoring progress and providing regular and immediate feedback, compared with an assignment system, does appear to enhance learning opportunities. It then becomes a matter for the professional judgement of the subject adviser to ensure that equity is maintained.

In relation to access, good computer support from the university is essential for those who have the equipment but limited computer knowledge, in order to maximise ease of connection and rapid and reliable solution of problems. Regular efficient use of the technology has the further advantage of encouraging access for those who are able to obtain it. For the others, the subject adviser's role remains the crucial factor until adequate computer technology becomes as ubiquitous as ordinary mail services and all students can be treated in exactly the same way.

6. REFERENCES

- Bates, A.W. (1995). *Technology, Open Learning and Distance Education*, Routledge.
- Brundage, D.H. & Mackeracher, D. (1980). *Adult Learning Principles and their Application to Program Planning*, Ministry of Education, Ontario.
- Feenberg, A. (1989). The written world: on the theory and practice of computer conferencing. In R. Mason & A.R. Kaye (Eds.) *Mindweave: communication, computers and distance education*, Pergamon, 22-39.
- Harasim, L. (1991). Teaching by computer conferencing. In A.J. Miller (Ed.) *Applications of Computer Conferencing to Teacher Education and Human Resource Development*, Ohio State University, 25-33.
- Kaye, T., Mason, R. & Harasim, L. (1989). *Computer Conferencing in the Academic Environment*, CITE Paper No. 91, Institute of Educational Technology, The Open University.
- Mason, R. (1991). Analysing computer conferencing interactions. *Computers in Adult Education and Training* 2: 3, 161-173.
- Stacey, E. (1997) Collaborative learning at a distance. In T. Evans, V. Jakupec & D. Thompson (Eds.) *Research in Distance Education 4*, Deakin University Press, 141-153.
- Stubbs, D. & Burnett, P. (1994). Computer anxiety and self-concept: results of an empirical study. Proceedings of the Asia Pacific Information Technology in Training and Education Conference and Exhibition, 28 June - 2 July, Brisbane, 323- 328.

Yeatman H and Stace R, (1997). Travelling in the slow lane of the information highway. ASCILITE '97. 27 November 1997. <<http://www.curtin.edu.au/conference/ASCILITE97/papers/>> (30 April 1998).

© Robyn Benson and Lesley Hewitt

The author(s) assign to ASCILITE and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced.

The author(s) also grant a non-exclusive licence to ASCILITE to publish this document in full on the World Wide Web (prime sites and mirrors) and in printed form within the ASCILITE98 Conference Proceedings. Any other usage is prohibited without the express permission of the author(s).

