

THE USE OF COMPUTER-MEDIATED COMMUNICATION TO SUPPORT THE FORMATION OF A KNOWLEDGE-BUILDING COMMUNITY IN INITIAL TEACHER EDUCATION

Ferry, B., Hoban, G. and Lockyer, L.

Faculty of Education
University of Wollongong

Email: brian_ferry@uow.edu.au.

Abstract

This study investigated how different types of computer-mediated communication (CMC) such as asynchronous forums, synchronous forums and e-mail were used to support an alternative approach to initial teacher education. This approach required students to work in small and large groups to solve 'real world' problems.

Students made maximum use of the forum accessible to all participants. Often the various forms of CMC were used in ways that were different to those intended by the facilitators. Further, many of the skills the facilitators used to mediating face-to-face discussion could be applied to on-line discussion.

Key words

computer-mediated communication, teacher education, knowledge-building community

Introduction

For over a thousand years universities operated on the assumption that information would be stored centrally and scholars would come to this central store of knowledge and collaborate to produce more information that would be stored at this site. Modern storage of information in digital form and the use of telecommunications allowed scholars and students to access information from any location that connects to the Internet. Thus, instead of people coming to the information, people now can have the information come to them.

While the technology allows greater access to stored knowledge, some researchers claim that it can contribute to a loss of community. Besser and Bonn (1996) assert that it is difficult to build collaborative relationships among students. However, this view is not shared by Romiszowski and Mason (1996). Their review of the literature showed that the technologies allowed for genuine conveyance of human communication and learners were able to develop relationships regardless of the reduced cues associated with computer mediated communications.

The context of this study required us to build a face-to-face community in parallel with a virtual (on-line) community. We felt that both communities were needed to support a new initiative the initial education known as the knowledge-building community (KBC).

A Knowledge-Building Community (KBC) in teacher education

Berietter and Scardamalia (1993) describe a 'knowledge building community' KBC as a group of people who investigate problems together. Members of a KBC work as groups

and not as individuals and are engaged in progressive discourse in an iterative process of knowledge building.

The Faculty of Education at the University of Wollongong applied a KBC model to the professional socialisation of preservice teachers. This model consisted of three interacting sources of learning:

- Community-learning (CL) which involved students, university and school facilitators sharing knowledge as a community;
- School-based learning (SL) which involved the students in authentic school contexts;
- Problem-based learning (PBL) which involved students working in groups to investigate problems.

Using computer mediated communication to support a KBC

The collaborative technologies used were designed to provide students with communication tools that they could use to engage in informal processes of knowledge sharing and construction. The current study contributes to the understanding of how the students used the available CMC to support the KBC and their understanding of the teaching profession. Also, it investigated whether students were prepared to experiment with other forms of CMC. Further, it adds to the understanding of the role that the facilitator plays in mediating on-line discussion.

Weedman (1998) reported that many early studies of the use of computer mediated communication found that students desire more face-to-face interaction, but others such as Holland (1996) have reported that students consider the process of collaborating on group projects on a CMC setting to be “much the same” as face-to-face. Several of these early studies have been criticized by authors such as Holmberg (1987) and Collis (1993) because they emphasized course development or learner outcomes rather than process outcomes.

In this knowledge building community, CMC is used to support process outcomes and we postulated that CMC would supplement face-to-face teaching by providing discussion forums that were non-threatening and allowed for learner control of communications and learner involvement in topic negotiation. The CMC tools would allow individuals to maintain links with their community of practice and to take advantage of the scaffolding that is provided by a dynamic social context. Such links are not limited by the constraints of time and space and allow for legitimate peripheral participation (Lave & Wenger, 1991).

The role of problem-based learning in the KBC

The Faculty also wanted to implement a PBL approach within the KBC. We felt that this approach would allow us to respond to recurrent themes emerging from studies which sought to follow-up graduates of teacher education courses. One was that many students reported that they left university with feelings of being under-prepared for life in classrooms and confused by what confronted them when they arrived at schools (Armour & Booth, 1999). The other was that schools reported that a majority of recent graduates

were unaware of how school and classroom cultures operated, and were unable to see the relationships between what they studied at university (MACQT, 1998).

Hoban (1999) believes that this situation arises because most teacher education courses present a fragmented view of learning and this can hinder the development of professional socialisation of preservice teachers. The literature about socialisation to the professions supports Hoban's view and Weedman (1998) asserts that "professional socialisation is a complex and variable form of learning, highly collaborative in nature."(p.1) It involves the transmission of social constructs, language, belief systems and symbolic lives that are unique to the profession (Schon, 1983).

Purpose of study

The purpose of the KBC project was to provide students enrolled in an initial teacher education course with an alternative pathway to professional socialisation. Such professional socialisation occurs through the transmission of values, norms, habitual ways of seeing which belong to particular occupations and shape the way that people conduct their work and establish themselves in the larger social world (Schon, 1983). During this study we investigated the role that CMC plays in *supporting* the formation of a KBC.

Thus the purposes of the study were:

1. to understand how members of the knowledge building community made use of CMC within a knowledge building community to developing their understanding of the professional role of primary school teachers;
2. to describe the role that the lecturers took in mediating on-line discussion among members of the knowledge building community.

The following research questions were posed:

1. How were the available forms of CMC used to develop an understanding of the professional role of primary teachers?
2. What were some of the limitations associated with the use of these communication technologies?
3. Did the members of the KBC use any other forms of CMC?
4. What role did the lecturers play in mediating the on-line discussions?

The participants

This study was limited to a group of 22 year one primary education students who were enrolled in the first session of an undergraduate degree in initial teacher education. The

age of the students ranged from 18 years to 45 years and gender composition was three males and 19 females.

Methods

Data were gathered from two sources: two student interviews held half-way through the session and at the end of the session; and text downloaded from the various communication technologies used.

Students gave us permission to download their messages and were aware that others would be able to read their messages. Only one student was concerned about this issue so we encouraged her to lurk in the background and only to contribute when she felt comfortable. This happened by the third week of session.

The criteria for classifying interview transcripts and downloaded text were based upon the three elements of the KBC community: community learning; school-based learning and problem-based learning.

Data pertaining to the lecturers role in mediating on-line discussion came from post-session interviews and analysis of text that students contributed to the discussion spaces. Names of students and lecturers have been changed for the purposes of reporting findings.

Results and discussion

The results are organised under the following headings : community learning; school-based learning and problem-based learning. Under each heading the contribution of each mode of CMC is discussed. Finally, the ways in which the CMC were used and the roles the instructors played in stimulating on-line discussion are described.

Community learning

Before problem-based learning (PBL) and school-based learning (SL) could be attempted it was necessary to build a learning community (LC). In order to facilitate face-to-face community learning students were housed in a special 'home room' where they met for part of each week with the lecturers who mediated their face to face learning.

An asynchronous forum (DISCUS) was used to support community discussion and this was organised to allowed for individual discussion, intergroup, and intragroup discussion as well as lecturer input. Students chose to access the forum either from the homeroom, campus computer laboratories or from their home computers. The first quote comes from an interview held early in the course.

This community atmosphere is just so beneficial to learning because so many people I knew last

year at uni spent the first few months by themselves, in lectures, and at lunch. How can you learn when you are upset and lonely?

(Susan 29.3.99)

Early in the end of the preparation phase the students learnt to use the asynchronous discussion space (DISCUS) and e-mail and Kime and Karen echoed Susan's earlier comments via the discussion space.

It's been great. I have loved working in-groups. I have had the best time. I have found that by working in a friendly environment you learn more.

(Kime 31.3.99)

I don't think I am learning and then I go home and all this stuff comes out. I think where did that come from? We talk. If we have a problem we talk... We had so much fun with our group poster we weren't afraid to say anything. We talked so much...One of my initial concerns about this course was that my friends weren't doing it and I thought that I would be on my own but just the opposite has happened and I have made so many friends.

(Karen 1.4.99)

Three themes emerged from the student quotes and information on DISCUS use. First, the students involved claimed that friendship and community support assisted their learning. They felt comfortable in their environment and learnt through participation in face-to-face, on-line conversation, and other class activities. Second, they were making use of the communication technology to express opinions. Third, most students preferred the community discussion space as opposed to the restricted discussion space because everybody could contribute and follow all of the threads of the conversations.

School-based learning

This source of learning was to provide students with an opportunity to better understand the culture of schools, teaching and classrooms. It was intended that students could achieve this through observing and interviewing teachers, providing support for teachers, and teaching individual and small groups of students. In the space of three weeks of in-school experience the students involved in the KBC project were beginning to understand that teaching was a much more multifaceted and complex role than they first thought. Lisa discussed her views on the forum and said:

I had no idea of the preparation, organisation and behind the scenes work that teachers had to do. I have had a respect for the work teachers do during the day, in school hours, but even in this I wasn't aware of the full extent of it; as I am still not now, but do feel more aware than previously. However a real 'eye opener' for me was how a teacher needs to have a very good understanding of the learning of the reading and writing processes. And that this would be an ongoing learning process, on my part. Teachers need to keep up to date with the current learning practices.

(Lisa 5.5.99)

Susan became the most prolific user of the communication technology and made regular contributions to the asynchronous forum and via e-mail to various trusted informants. Below is a copy of one of her later evening e-mails to one of our researchers.

Teachers talk so much in the staffroom about different topics; it really is a collegial atmosphere. It's usually focused on different activities that are happening during the day and how they're going to coordinate them all. They all help each other out with the stuff that's going on. They seem to have about 700 trains of thought at once, these teachers. I don't know how they can think of so many things at once. I was never aware of the intense preparation months before hand.

(Susan 12.5.99)

The above quotes from the KBC students are indicative of the increasing awareness that students were describing and reporting. Also, they were expressing similar views via different modes of CMC. It would appear that in a very short space of time the students, through their immersion into the school culture, were able to appreciate and witness the complexity and multitude of a teacher's role. Also, they could use a variety of modes of communication to express these ideas.

Problem-based learning

The third of the three learning sources was critical for students to extend their understanding of the professional role of teachers. Students needed to be aware of their role in PBL and the preparation phase engaged the students in several workshop and assessment tasks where they worked in small self-directed groups in order to solve open-ended problems. However, as Lave and Wenger (1991) assert the community does not necessarily have to be warm and effusive; instead it can be diffuse, fragmented and contentious. This was the case with several groups involved in this study and the following e-mail from Julia illustrates this point.

Initially I thought that we were unable to communicate effectively, as some people dominated the discussions while other people had good ideas that were not listened to... 14.5.99

Our inexperience in developing the first problem that students were to solve whilst in schools also contributed to some confusion and generated intellectual unrest. The silence that befell the room with the issuing of first problem package one was an indication that we needed to rethink our approach when we prepared our second problem. The students were reticent to voice their real opinions about the first problem in class and the comments below were from class discussions held at the culmination of the first problem (which had a literacy focus) illustrate this point.

I can't say I 'm sorry that it's over as it was huge! But I have learnt so much and I have a teaching resource, which I can keep.

(Kime 13.5.99)

When I go back over what we have done in our group work and also what I have done myself I am just amazed at how much I have learnt and how far we have traveled.

(Lisa 12.5.99)

However, they were quite forthright in voicing their concerns through the asynchronous discussion forum and via e-mail. They were prepared to say that the problem was too big and lasted for too long as they felt that it overshadowed and dominated their life. Susan although a competent student who produced a high quality assessment task for problem one felt tired and drained and this is what she contributed on the forum.

I'm slowly dying. I am just so tired that I cannot think anymore. I am a zombie. This whole literacy thing is just so enormous. I hate assignments and I am so sick of this problem.

(Susan 14.5.99)

The combination of several new factors for the students (the role of a teacher associate combined with the problem assessment task) prompted us to modify the second problem so that we covered less material but to a greater depth and Julia's final e-mail about the second problem illustrates this point.

We were able to accomplish the second problem better as we had more knowledge of how to go about it, it wasn't as big as the first one.

(Julia 28.6.99)

The role of computer mediated communication

The students made use of group and individual e-mails, the asynchronous discussion space contained 26 discussion topics by the end of session. These were classified as problem-related (9), school-related (7), group-related (5) or personal (5). One group that were widely separated in terms of distance decided to use a synchronous discussion space that they downloaded from web (ICQ). The following quote shows the general tone of their conversation on this forum was about organising group tasks and group meetings.

Being a leader isn't that involved it just means keeping people on task....We'll see what we can get done on Thursday, I feel we need to focus and brainstorm etc and we need a peaceful place to do that.

(Fiona 4.5.99)

The themes that emerged from the various forms of CMC used were:

1. in general the tone is one of communication about the problem, the school, the groups or assessment;
2. controversial comments were delivered anonymously. For example one entry on the discuss space said:

It is really a shame to see many people being all secretive and competitive please make an effort to try to limit the competition. We are all filling the vessel of information together..

(Anonymous 7.5.99)

One member of the lecturing team was 'lurking' in the background and he took the opportunity to mediate the discussion. His entry follows:

...I think that it is healthy that we have a vehicle (discus) to express our comments publicly be anonymous or not. It is good that there are different perspectives on what we are doing and it is important that we stay open minded to hear these perspectives.

(Hoban 11.5.99)

3. without direction very little 'deep' knowledge building happens through these modes of communication. The lecturers have to 'lurk' in the background and be prepared to lead the discussion when they think it necessary. This strategy was successfully employed to tease out controversial issues as shown above;
4. initially access to the technology at home restricted a few students as at least one person from each school group was not connected to the Internet at the start of the session. At the conclusion all except one had a home connection to the Internet;
5. CMC was a support and a catalyst for other modes of communication such as small group face-to-face meetings (formal and informal), large face-to-face groups (formal meetings at university) and numerous telephone conversations (informal).

Conclusion

This study has been a new learning experience for students and lecturers and we admit that we still have a great to learn about the role PBL in the KBC and the use of computer mediated communication. We feel that the KBC concept supported by computer mediated communication has contributed to the professional socialisation of students by addressing four issues. First, it has helped students to define the profession in which they will work and to realise that they are responsible for the development of the knowledge and skills needed to become a member of the teaching profession. Second, they have a better understanding of the professional life of teachers and the nature of 'teachers' work'. Third, they have come to realise that there is a body of knowledge that is needed for education for the profession, and finally they have developed a sense of professional identity.

We also learnt that when students use computer mediated communication in a KBC they can be very creative and forthright in sharing opinions and ideas. However, like face-to-face conversation, they can deviate from intended pathways and lecturers need to continually monitor the discussion and provide input at appropriate moments — just establishing the community forum is not enough.

We also found that the asynchronous discussion space (DISCUS) was the most popular forum but the other modes of CMC such as personal e-mail gained popularity as friendships developed.

References

- Armour, L. and Booth, E. (1999) Analysis of a questionnaire to primary educators at schools accepting students for the six week extended practicum. Report by Faculty of Education: University of Wollongong.
- Bereiter, C. & Scardamalia, M. (1993). *Surpassing ourselves*. Open Court. Illinois.
- Besser, H. & Bonn, M. (1996). Impact of distance independent education. *Journal of the American Society of Information Science* 47, 817-883.
- Collis, B. (1993). Evaluating instructional applications of telecommunications in distance education. *Education and Training Technology International* 30, 266-274.
- Hoban, G. H. (1999). Using a metacognitive framework to guide experiential learning in teacher education classes. *Journal of Experiential Education*. In Press.
- Holland, M. P. (1996). Collaborative technologies in inter-university instruction. *Journal of the American Society for Information Science*, 47, 857-862.
- Homberg, B. (1987). The development of distance education research. *American Journal of Distance Education*. 1, 16-23.
- Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- MACQT, (1998). Teacher preparation for student management: Responses and directions. Report by Ministerial Advisory Council on the Quality of Teaching, October, 1998. Sydney: NSW Department of Education and Training.
- Romiszowski, A. J., & Mason, R. (1996). Computer-mediated communication. In D. H. Jonassen (Ed.), *Handbook of Research for Educational Communications and Technology*, (pp. 438-456). New York: Macmillan LIBRARY Reference USA.
- Schon, D.A. (1987). *Educating the reflective practitioner*. San Francisco: Jossey-Bass.
- Weedman, J. (1998) *Burglar's tools: the use of collaborative technology in professional socialisation*. Paper presented at ASIS Midyear'98 Proceedings. Available at URL:
<http://www.asis.org/Conferences/MY98/Weedman.html>.

© Ferry, B., Hoban, G. and Lockyer, L.

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

The author(s) also grant a non-exclusive license to ASCILITE to publish this document in full on the World Wide Web (prime sites and mirrors) and in printed form within the ASCILITE99 Conference Proceedings. Any other usage is prohibited without the express permission of the author(s).