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WHAT DO LEARNERS WANT FROM COMPUTER-MEDIATED COMMUNICATION SYSTEMS?

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Abstract. Computer-mediated communication (CMC) in education has both benefits and problems. The benefits could be increased and the problems alleviated by improved design of CMC systems. Following a user-centred design approach, interviews were therefore carried out with distance learners who use CMC systems. The aim was to elicit ideas for improvements, and to discover which features students find helpful and unhelpful. Ten students of the UK Open University, which uses the FirstClass computer conferencing system, were interviewed individually or in a focus group. Observations of students using the system were also carried out. The study revealed three major areas where enhancements are needed: dealing with information overload; increasing social presence; and providing tools for synchronous communication. The importance of a personalised interface and a high degree of user control were also highlighted.

1. INTRODUCTION

Computer-mediated communication (CMC) increasingly forms a part of a learner's experience of higher education. This is particularly true for distance learning, but also for campus universities that use Virtual Learning Environments. Although CMC has many benefits for learners (Salmon, 2000 p.17), there are nevertheless problems (Murphy at al., 2001), such as low participation.

Many educators have thought carefully about how the benefits of CMC can be maximised. In most cases their approach has been to consider how CMC is used – for example, making it part of the course assessment (Goodfellow, 2001). An alternative approach is to consider how CMC systems could be designed to support learning more effectively (e.g. Scardamalia & Bereiter, 1996). This approach is taken in the current paper, which reports on the first stage of an investigation into how CMC systems in higher education could be improved. The objectives of the study were:

- to discover which aspects of CMC systems learners find helpful/unhelpful in their studies;
- to elicit ideas for new features which would be beneficial for supporting learning.

The study focused on distance learning at the UK Open University, which uses the FirstClass computer conferencing system. Interviews were carried out with students of the new course *T209 Information and communication technologies: people and interactions*. This course attracted over 2000 students in its first year of presentation (2002). CMC is an integral part of the course and plays a significant role in the course assessment. Students use FirstClass for communication in course-wide conferences, within local tutor-groups and in small project teams.

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2. METHOD

2.1. The interviews

Interviews involving 10 students from four different tutor groups were carried out, just before or just after the end of the course. By this stage all students had experienced collaborative working in their tutor groups and had taken part in an assessed group project supported via CMC. Many students had also used the course-wide conferences.

Three formats of interview were used:

- A focus group;
- Individual face-to-face interviews;
- Individual telephone interviews.

The focus group consisted of 4 men and one woman. For the individual interviews there were 4 women and one man.

When the research was planned, the focus group was the preferred method, because of its potential to "produce data and insights which would be less accessible without the interaction found in a group" (Morgan, 1988 p. 2). However, in a distance learning context it proved difficult to find enough students who could meet at a particular time and place. So only one rather brief focus group took place, after a local tutorial.

Three individual, face-to-face interviews were carried out. The interviews were each followed by a short observation in which students demonstrated how they used the system, and talked through their typical activities. The two telephone interviews were both carried out in the evening, at the students' convenience.

2.2. The interview schedule

In all cases, the same interview schedule (set of questions) was used. This was designed to be fairly general, in order to provide opportunities for students' ideas and suggestions. It included questions about:

- usability;
- features which interviewees liked and disliked;
- problems and benefits of CMC;
- what students might suggest to the system designers;
- features which are useful in particular contexts (large conferences and small-group work).

2.3. Conducting the interviews

The individual interviews took between 20 and 40 minutes, and the focus group discussion lasted for 40 minutes. Written notes were taken for all the interviews, and

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audio recordings were made (with the students' permission) of the face-to-face interviews.

In the focus group setting the main issue was trying to facilitate input from all members of the group. There was a tendency for one or two group members to dominate. It became clear that tighter facilitation was required, in order to create a better balance of inputs. However, in other respects the focus group format seemed to fulfil its promise. The students triggered ideas from each other, and built on each others' suggestions.

When conducting the individual interviews it was important to create a relaxed atmosphere so that the students produced as many of their own ideas as possible. The later questions in the interview often evoked responses to questions asked earlier. This indicates that the 'open' nature of the questions proved fruitful.

2.4. The observations

After each of the three individual, face-to-face interviews the students were asked to log on to FirstClass and demonstrate how they used the system. The effectiveness of the observations varied from the point of view of data gathering. The observation after the first interview did not provide much additional information. The second student used the observation period to demonstrate the points he had made in his interview. However, in the third case, which was the only one where the interview took place in the student's home, the observation was fruitful. The student commented on a number of aspects which she had not mentioned in the interview. This confirms the importance of carrying out observations in the user's place of work (Ford & Wood, 1996).

2.5. Data analysis

The data analysis process was iterative. An initial summary was made of the main points which had emerged. Each student's detailed comments were then noted under a number of headings (e.g. "Likes", "Dislikes" "Desired features"). Many of the students' had made similar points, so a code was allocated for each main point and the codes were used to categorise all the students' comments. This process helped to draw out common themes, with a record of how many students had commented on each. Using this information the initial summary was revisited. Then an affinity diagram (Holtzblatt & Beyer, 1996) was created. This is a diagram in the style of a mind-map which groups ideas together. When this was complete it enabled the summary document to be refined further, adding more detail, checking that nothing had been omitted, and confirming the numerical information.

3. RESULTS AND DISCUSSION

In the analysis stage a number of themes emerged. The results are discussed below grouped into these themes.

3.1. Information overload

When working in large conferences, students are overwhelmed by the number of messages. Although some of the messages are very helpful, many are not worth reading. One student described this as a "poor signal-to-noise ratio". It takes too long to read through all the messages, and it is difficult to identify those that are valuable (to "sort the wheat from the chaff", as one student put it). This is partly because the message title is not always a good indicator of the content of the message.

These problems are well known to educators using computer conferencing on large courses (Mason, 2001, Salmon, 2000). Good threading tools can help by separating the messages into different discussions, and indicating where these discussions branch into sub-discussions. Sorting and searching tools are also useful when dealing with large conferences. The ability to sort messages by thread was seen as helpful by students.

The problem of overload also arises in relation to the number of conferences. There are too many, and useful ones cannot easily be found among them. The students presented this as a navigation problem - how can they get to the conferences which are of interest to them? The use of sub-conferences is helpful in this respect. One student, showing her tutor-group conference containing a number of sub-conferences, described it as "nicely broken down". Ideally students would like FirstClass to act as a personal portal, showing only those conferences which are relevant to them. Other conferences could be available, but hidden.

3.2. Social Presence

Many issues raised by the students relate to the idea of 'social presence' (Short et al., 1976). Students need to feel that they are communicating with real people, even though the communication is via a computer. However, text-based communication is currently seen by some students as impersonal. This could partly explain the unfortunate tone of some messages (which one student described as "awful"). Sproull and Keisler (1991, p.49) note that, "As a consequence of the low level of social information in computer-based communication, and its perceived ephemerality, people lose their fear of social approbation."

To help overcome these problems, students need to know something about the people they are communicating with. Many students find FirstClass resumes helpful in this respect, and one student said she was "disappointed if someone hasn't got one". One student suggested that resumes should be compulsory. Perhaps a better suggestion is to prompt users to write a resume when they first log on.

Another possibility for enhancing social presence would be to encourage users to choose or create a graphic to represent them (Alexander, 1995; Preece, 2000 p. 153). This would appear beside their name in lists of messages. FirstClass has this facility, and some students already use it.

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3.3. *Synchronous facilities*

Presence can be enhanced by the use of synchronous facilities, and these formed a strong theme from the students. Some students found the FirstClass Chat tool helpful and motivating when carrying out group work. However there are problems with Chat facilities because the overlapping conversations can become confusing. Another issue is that there is not normally a record of the Chat session. If Chat is to be used for collaborative tasks and decision-making, an option is needed to keep a transcript.

When carrying out group work, some students use the normal FirstClass conference facilities, but try to have all members of the group online together. This speeds up decision-making considerably. It also avoids the frustrating delay (which can be several days) between submitting a message and getting a response. This frustration can be alleviated somewhat by the History facility, which at least tells students who has read their message, and when.

A facility which many students want is notification when certain people (often described as "buddies") come online. This is characteristic of instant messaging systems. FirstClass has a 'Who's online?' feature which lists those who are connected, and students reported this to be useful. One student described how members of her project team held an impromptu meeting "because we knew we were there". One suggestion is that an image of a "buddy" should pop up in a corner of the screen when the person logs on. As more users obtain web video cameras, this could be a live web-cam image. Facilities for video or audio conferencing in general were seen as desirable by students. However, distance learning courses cannot rely on synchronous communication, as it is difficult for all students in a group to be available at the same time.

3.4. *Usability*

All the students described the FirstClass client software as easy to use. Nevertheless, some students reported that they did not use many of the features which are available. (Sweeping his cursor over the system's icons, one student said "I don't know what half of these do".)

One aspect of the interface which students liked was the ability to customise it. For example, users can decide how messages should be listed. Students liked the idea of being able to personalise the system - being in control of how it behaves. They disliked situations where the system takes control, for example when system messages auto-open or stored mail messages expire.

4. CONCLUSIONS AND FUTURE WORK

This study revealed three aspects of CMC which are particularly important to learners:

- the problem of information overload;
- the need to enhance social presence;

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- the desire for synchronous communication tools.

The FirstClass system has some facilities which address each of these issues, but it is clear from the students' comments that better features are needed. The study also identified important aspects of usability. Ease of use is an obvious one; others are a sense of control and a personalised environment.

In identifying these issues, and providing detailed information on them, the study fulfilled its objectives; however there is more work to be done. It is necessary to gain the views of students on other courses, tutors, course designers and system designers. Interviews with users of other CMC systems also need to be carried out.

However, the present study has already identified some areas where enhancements could be made. On the basis of this data, and on data from further studies, improvements to CMC systems could be prototyped and tested with users. In this way, CMC tools can be developed in the future which provide a better fit with the needs of learners.

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