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“Hope this helps”: peer learning via CMC

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Abstract

Computer-mediated communication (CMC) is increasingly used in distance education to provide opportunities for peer learning and support. CMC allows students to share understandings, discuss misunderstandings, and learn from each other.

This peer learning can be more effective than interventions by the tutor, for a number of reasons. Students are willing to expose their difficulties to their peers, whereas they might feel uncomfortable doing so to their tutor. Fellow-students understand difficulties which a tutor, with a more advanced view of the topic, may not appreciate. CMC provides an invaluable opportunity for students to discover that other learners are having similar problems to their own.

This paper reports on peer learning via CMC in an Open University course on Digital Communications. Members of staff moderated course-wide conferences whose main purpose was to allow students to help each other. The research reported here was based on a study of conference transcripts. The aim was to identify the ways in which peer learning took place, and the conditions which supported it.

Introduction

The UK Open University has been using computer conferencing to support distance learners for many years. There are a number of models for the use of this technology, ranging from courses run entirely online to the optional use of conferencing for self-help purposes (Mason and Bacsich, 1998). This paper reports experiences from the latter end of the spectrum. Course-wide computer conferences were provided for students on a course on Digital Communications (T305). Students were encouraged to use the conferences to ask questions and help each other with aspects of the course. The conferences were moderated by members of staff. The philosophy of the moderators was to intervene as little as possible, in order to allow students to solve each others' problems and share their understanding.

From experience in moderating the conferences, it was clear that there were many helpful exchanges between students; difficulties were resolved, questions answered and explanations given. The study reported here was undertaken in order to investigate these learning interactions in more depth, and to establish the conditions which supported them.

The course context

T305 Digital Communications was first presented in 1999, and attracts about 1000 students each year. The course is at a level equivalent to the third year of a full-time UK undergraduate degree. Most T305 students are in the final stages of their degree, and have several years' experience of Open University study. Most students are in full-time employment, many in the communications industry. The course lasts for nine months and is divided into 6 blocks, which are studied in sequence. Assessment is by:

- written assignments, marked by a tutor (tutor-marked assignments or TMAs);
- assignments consisting of multiple choice questions, marked by computer (computer-marked assignments or CMAs);
- a final examination.

Each student has a local tutor who marks his or her work. The *FirstClass* conferencing system is used for communication among students, tutors and the course academic staff. For each block of the course, there is a set of conferences which are open to all students on the course, together with tutors and staff. These conferences include a general block conference and conferences for discussion of each of the assignments in the block.

The study

This paper reports on the use of the course-wide conferences for Block 1 of the year-2000 cohort. The Block 1 conferences were moderated by the author of this paper, with support from other members of staff. The research is based on a study of the transcripts for three of these conferences:

- the general Block 1 conference;
- the conference for the first tutor-marked assignment;
- the conference for the first computer-marked assignment.

The aim was to establish the kinds of interactions which took place and the role these interactions played in learning. A particular interest was the role of the moderator, and the extent to which a hands-off approach to moderating was appropriate.

The following sections give a qualitative account of the findings. No attempt has been made to carry out a content analysis; instead the approach used in the paper is to provide a flavour of the conferences, using examples of the interactions between students. The paper includes many messages from the student conferences. In all cases the names of students have been changed for reasons of privacy, and in some cases the punctuation has been modified for ease of reading. The paper includes examples of students' queries, the responses they received from each other, and the discussions they engaged in. These examples illustrate the thoughtfulness with which the students tackled their own difficulties and helped others to tackle theirs.

Asking for help

Many of the messages in the conferences were straightforward requests for factual information. These usually elicited a reply from another student, with no need for further discussion. The following query and response sequence is typical.

Can someone tell me how to interpret the SDL Input symbol which contains more than one signal? ie. Sig1,Sig2,Sig3.

*Thanks ,
Paul.*

Can receive any of the 3 input signals to move to the next state.

Sometimes there were requests for information which went beyond the course material. Because the cohort of students included many who were working in the field, these requests could often be answered by students with appropriate specialist expertise.

We are told [...] that speech can reach maximum frequencies of much higher than 4KHz. Does anyone know (approximately) what the 'real' max freq of speech is??

*cheers
Mel*

The normal range of speech falls between 100 and 5,000 Hz although sound can be heard up to 20,000 Hz

David

Other messages were about practical aspects of studying the course (for example, a student might ask about the procedures for completing a computer-marked assignment). In these cases the conferences provided a quick and friendly way through some of the administrative aspects of studying with the Open University. This type of communication also provided reassurance, particularly to students who were new to distance learning.

Students also asked for advice on how to cope with work or home issues which were affecting their studies. Fellow students replied suggesting strategies based on their own experience.

What is the best thing to do? I have been sent away for work over the past couple of weeks unexpectedly and I have just got back. I have had very little time to study the last part of block 1 and I haven't even started the TMA yet. Is it best to miss the TMA, or get a couple of good answers in, not enough time to do it all.

*Help
Neil*

Neil, The main thing is to contact your tutor and try and negotiate a little more time, in my experience they are normally understanding. I would definitely try and submit something even if you only answer parts of each question, you might be surprised how quickly the marks add up.

Good luck

Students also asked questions specifically related to the assignments. This was encouraged, although it did raise the issue of how much help with assignments it is appropriate for students to give to each other. In fact students were very skilled in judging what to ask and how to respond to such requests. None of the messages gave too much away, and it was clear that students had no wish to ‘cheat’.

[...] please check that there is a valid option given for this question [...] If there is one at least I will be sure that I have not got the wrong end of the stick somewhere.

Thanks, Tony

Hi Tony, I got an answer [...]

Joe

I also got an answer. Hint : don't forget the reset signal to the receiver.

Good luck.

Bob

Thanks, Bob, Joe,

Back to the drawing board then!

Tony

Once students had submitted their computer-marked assignment and received their marks, there were a few messages from students discussing why they had got a question wrong. A general feedback document was provided soon afterwards, but in the meantime students were able to explain to each other the thinking behind the answers, as well as showing solidarity with each other.

Hi all,

I just got my results and they say that I got question 5 wrong and the correct answer should be G. I have looked again but still think the answer is D. What does anyone else think, or am I going crazy. Only the first packet is forwarded by the router ?

Alan.

Here's how to look at this question. Packet one. Comp A sends to Comp D. The bridge will see the signal and forward onto the next LAN segment. [...] I hope this explains the answer to you. By the way, It's a bridge not a router. Good luck with the rest.

Nick

Pain, isn't it? Was the only one I got wrong and one of 6 that I was prepared to say were definitely correct. I came up with the logic Nick has used after re-reading it & the text. Wouldn't kick yourself too much - this CMA is only 2.5% of the total marks on the course!

Liz

Giving help

One important area where students were able to help each other was in pointing out useful resources, particularly web sites. Sometimes this was in response to a question.

Just a quick query. What exactly does a Bridge or a Router look like? Are they similar physically as servers? [...]

Steve

Have a look at www.blackbox.co.uk and use search for the router or bridge. They have pictures of these devices - they are various sizes, colours etc. similar to modems but are normally a bit bigger with a few RJ45 sockets etc. [...]

Regards

Tim

But sometimes students were just pointing out a useful resource to everyone.

Anyone stuck with those technical terms?

Have a look at this site. www.its.bldrdoc.gov/fs-1037.

Dave

Students took great pains to provide explanations for each other, in response to requests for help. These explanations frequently used analogies. The response below was to a query about what happens when different parts of a network have different data rates.

Hi Stephen,

Try looking at this like a road system. The FDDI ring is a motorway with a max speed of 100 mph and the LANs are the local roads where the max speed is 10 mph. When you drive a car down a local road you can't go at Motorway speeds! Neither can you add together the various speed limits so that you can go faster! Remember also that the 'real' speed of a network is only as fast as its SLOWEST link.

I hope that helps.

Many responses were a careful balance of advice, explanation and directions to resources. For example, the following message was a response to a plea for help from a

student who said that she had ‘completely lost the plot’ with a set of assignment questions about a particular topic.

*Read carefully Block 1 book page 98. Remember that a 32-bit word is 4 octets.
The 4-bit header length refers to the number of 32-bit words in the header.*

This response is very similar to one which might have been given by a tutor. There are some hints, help with terminology, and a pointer to a resource. But the underlying assumption is that the original student will now review her understanding, and go on to discover the answers for herself.

Sharing understanding

The conferences contained a number of discussions where students explored ideas together in order to share and build their understanding. In these discussions, students followed up and queried each others’ explanations, showing that they were carefully considering the ideas. As Ruberg, Moore and Taylor (1996) found in their educational use of CMC, students offered each other different ways of thinking about the concepts in the course. Their messages were in a spirit of helping each other to understand, rather than telling each other what to think. The explanations were often presented as simply one of a number of ways of understanding the ideas. For example, one discussion began with a student sharing an analogy of posting an assignment to his tutor, which helped him to understand the TCP/IP Internet protocols.

*I've come up with the following which is how I understand TCP/IP. It may not be totally correct but it's the way I think about it.
Suppose you write your TMA and it covers a number of pages.
On each page you write your name/reference number/page number and total number of pages. TCP.
You put each page into an envelope and write the tutor's address on it. IP
The envelopes are then dropped into a post box. Transport Layer.
Now I just need someone to explain UDP in a similar way.
Steve*

Another student responded to the invitation to extend this analogy to UDP (an Internet protocol which - in contrast to TCP - does not use acknowledgements).

TCP suggests the tutor will reply to the tma to say received or not. Maybe damaged by the postal service also. UDP is like the tutor may or may not get the TMA. You will never know.

A third student explored the analogy a little more, at the same time making a light-hearted ‘dig’ about slow turnaround of assignments.

*Well I consider sending a TMA to be more like an unreliable version of TCP.
You send the TMA and get proof that it is sent and have to wait about a month
before the ACK arrives to know that it's been sent correctly.*

Finally another student suggested an alternative analogy.

*That's a good point, but you still get confirmation. TCP is rather like having a
conversation with someone who responds with verbal or visual replies. UDP is
like talking to someone who may as well be asleep. They might be listening, they
might not. You will have no reply in any manner to say they have heard you.
Would this be a better example of the transport layer protocols?*

There was evidence in the conferences that discussions of this kind, particularly those involving several students, were effective in helping students to overcome difficulties. One such discussion thread began with the following message from a frustrated student, who was trying to tackle one of the assignment questions.

*I have reached a point where I don't know what I am doing. SDL is getting on
my nerves, I don't get it!!!! What point does the question refer to? Can anybody
explain to me in plain English, correction extremely basic English, what is this
question is about.
Cheers. I will come back as I progress through the following questions, so I
WILL BE BACK!!!!!! George*

In response there followed a series of messages involving three other students. The first student (John) suggested an approach to the problem.

*Start at the top and work down, x is assigned a value (10) and the system enters
the state Working. Now apply the inputs in the order they are received [...]
After you have applied all the inputs and their associated maths you will have a
final answer for the value of x !!!
I hope this helps
John*

A second student (Rob) responded by querying an aspect of John's suggested approach.

*But John ,
I believe that this is not correct. When the Boolean condition [...]
Please check this -I'm quite willing to be wrong !
Rob*

John replied, giving further explanation.

*Rob, The SDL symbol for a save is a parallelogram (page 25 of reference book).
If you think about what the decision box is doing , all it does is [...]
I hope you agree
John*

A third student, Lynne, then posted the following message.

*Hi I have gone with John on this one Rob. I hope we are correct and thanks for
the info as it helped me past a mental block of which I seem to be suffering a lot
at the moment. Lynne*

There followed a message from Rob, who could now see why John's approach worked.

*Thanks Folks - I think I see where my hang up was - In the SDL example [...]
Got it !
Rob*

Finally, the original student, George, posted the following message:

*I had another look last week and I followed your instructions and I did see the
light then. Thanks so much John, Rob and Lynne.
George*

Affective aspects

When reading the conference messages, one characteristic which stands out is the supportiveness that students show for each other. Students can feel very exposed when submitting a message asking for help, so this supportive atmosphere is vital to provide the openness needed for students to learn from each other (Wegerif, 1999). Students' messages were always sympathetic and tactful. This is consistent with the 'supportive group dynamic' identified by McConnell (1990) in a course for which CMC was a core medium. It is pleasing to find that a similar dynamic can be achieved in a context where CMC is, in effect, optional.

The small ways in which students showed care for each other all contributed to creating an environment where students felt free to ask questions and expose problems. It appeared that many students preferred to discuss their difficulties in the conference, rather than approaching their tutor. This could be because the difficulties seemed ill-defined or 'stupid', or because fellow students were more likely to be 'on the same wavelength'. It could also be because the students valued the experience (rare to distance learners) of being a member of a learning community. The friendly responses of other students helped to build confidence, and encouraged students to believe that the questions in their minds were not 'stupid', but were signs of a genuine attempt to get to grips with the course.

There were a number of specific ways in which students contributed to creating this supportive and friendly community within the conferences. It is not clear whether these practices were intentional or were picked up subconsciously from the messages of other students and staff. In either case, there certainly seemed to be supportive 'norms' established within the community. Ruberg, Moore and Taylor (1996) claim that such social conventions determine the nature and characteristics of participation.

One clear example is the use of a phrase such as 'Hope this helps' after an explanation. Another example is the use of a deprecatory phrase at the end of a message. This was used in a virtually identical way by a student:

P.S. Sorry about spelling mistakes.

and by a member of staff:

I hope this has helped and that I haven't made too many spelling mistakes.

The implicit purpose of each of these comments seemed to be one of 'de-fusing' the expertise in the message, so that the person giving help was once more on the same level as the person asking for help.

Another way in which students gave each other moral support was by using 'me too' messages. These occurred in response to a student exposing some problem, such as being behind with the course, or feeling unsure of how to tackle an assignment question. These messages would serve to reassure the original student, and also those who responded, that they were 'all in the same boat'.

*How do we keep the word count to 350? I've managed to cut it down to 503 -
how much detail are we expected to provide?*

Judy

*I have the same problem. Words, words and more words. What do you leave
out? who knows. Same old problem you (I) can't see the wood for the trees
when I proof read it so marks are lost for too many words and not enough
information.*

Hope you find a way of cutting back

Roger

The response above from Roger provides a good illustration of the subtle ways in which students showed respect and tact for each other. It looks as if Roger was going to say 'you can't see [...]', but he probably realised that this could sound like a criticism, so instead he wrote 'you (I) can't see [...]'. In this way his message adopted a tone of sharing the problem.

Looking behind the apparent content of messages in this way provides insights into the possible motives of students. For example, we might consider why an explanation was often followed by a pointer to supporting resources, as in the following message. This

message was a reply to a student who was puzzled about the OSI reference model (a framework for understanding network protocols).

When referring to the lowest three layers of the OSI model, you are referring to:

- 1. Physical*
- 2. Data Link*
- 3. Network*

The Data Link layer can be broken into two sub layers - the Media Access Control sublayer (MAC) and the Logical Link Control sublayer (LLC).

Take a look at <http://www.cramsession.com/cramsession/cisco/ccna/guide.asp> for a good summary of the OSI layers.

There are a number of reasons why students might add a reference to a resource after their explanation.

- It provides a source of authority. This will give students who read the message confidence in using its contents.
- It shows that the explanation can be found in the course (or elsewhere), rather than being the result of some ‘impressive’ thinking by the student who is offering help. This is another example of the de-fusing aspect mentioned earlier, which keeps students in a relationship of equals. The subtext is ‘I only know this because it was in the course/on the web. You could easily know it too.’
- It signifies an independent attitude to learning within the student community. There is an assumption that readers of the message will want to deepen their understanding by looking at the quoted resource.

The overall impression of the conferences was of a community of mature people who wanted to help each other to learn. This desire to help is perhaps a natural human attribute. It is partly altruistic, of course, but, as Constant, Sproull and Keisler (1996) point out in their study of electronic ‘weak ties’, helping others also has benefits for the helper’s self-esteem. This is illustrated by a quote from a student on another Open University course which uses computer-conferencing. In a list of the benefits of collaborative learning, she included ‘hearing yourself be helpful’.

The role of the moderator

The moderator of the conferences, and other members of staff, tried to intervene as little as possible, in order to leave space for students to learn from each other. However it was vital for the moderator to follow the conferences closely, in order to respond quickly when necessary. The general approach was to allow time for students to answer each others’ queries, but then to post a message if necessary. There were several situations when a response from the moderator seemed to be required:

- if a question was asked which was well beyond the course content;
- if a student specifically requested a response from the course team;

- where it seemed helpful to confirm (or, rarely, to correct) the content of another student's reply;
- if students were 'thrashing around' with an issue, usually due to not understanding each other fully;
- if, after several days, there were no responses from other students which addressed the problem.

One thing which was noticeable in the conferences was that an input from a member of staff nearly always stopped further discussion on the topic. This was a further reason for minimising staff input.

Most students seemed comfortable with the hands-off approach, and appeared to be happy to support each other, rather than expecting 'answers from above'. This finding is consistent with McConnell's (1990) conclusion that strong leadership is not essential for a successful computer conference. This may be a particular characteristic of courses with more experienced students, who consider themselves to be independent learners. At a pragmatic level, the hands-off approach saves the moderator considerable time. Although time must be spent in a close reading of students' messages, there is a significant time saving in 'teaching', because the students largely do this for each other.

Participation

The preceding sections have shown some of the benefits which can arise when members of an online community of learners take the time and trouble to support each other. Unfortunately, on this course, as on others (Mason, 1989; Mason and Bacsich, 1998), the proportion of students who played an active part in the conferences was rather low. In each of the conferences studied, there were an average of 160 messages and 75 students actively taking part. This was from a course population of around 1000. However, a typical message was read, or downloaded to an off-line reader, by about 300 students. These figures are in line with data given by Rapaport (1991).

Although the number of active conference members was small, there were a significant number of students who benefited from reading the messages and observing the learning dialogues which took place. The value of this 'legitimate peripheral observation' (Lave and Wenger, 1991) is confirmed by results from a survey of T305 students at the end of the first year of presentation. Looking back on the course as a whole, 45% of the respondents said they found the block conferences 'very useful', and a further 32% found them 'fairly useful'. It is clear that students who read conference messages but do not contribute, nevertheless find this activity valuable. This is reassuring, but it would be pleasing to find ways of encouraging the observers to become more active participants. Further research is needed to discover why some students are active, others simply observe and many do not use the conferences at all.

Of the students who did submit messages, there were none who dominated any of the conferences. In each conference there were only a few students who submitted more than 4 messages; the largest number of messages submitted by any student was 11. Overall, the moderator and other members of staff submitted only about 12% of the conference messages. Most of these were in the main Block 1 conference, which was the

first conference the students used. It was important to welcome the students to this conference, and encourage them to participate (Wilson and Whitelock, 1998). The moderator's initial messages would also help to 'model' an appropriate tone for the subsequent discussions (Brown, Collins and Duguid, 1989).

Conclusions

The discussion and examples in the preceding sections show that learning dialogues were taking place among students in the conferences. Although the proportion of students who contributed to these dialogues was relatively low, a much larger number of students benefited by reading the messages. This enabled them to see the problems other students were having, and the help provided by their peers.

Many of the dialogues were of the question-and-answer type; but there were also more extended discussions, where a number of students explored their understanding of some of the more difficult ideas in the course. In these discussions, students questioned each others' responses, in an effort to ensure that the answers given were consistent with their own understanding. Where this was not the case, students engaged in further discussion to resolve the situation. This is an example of collaborative, constructivist learning.

The students engaged in these learning dialogues largely without intervention from the moderator or other members of staff, although students knew that the moderator was closely monitoring the discussions, and would contribute when necessary. Students were willing to trust each other for help, and largely did not seek direct answers from an 'authority'. This independent approach to learning may be characteristic of more experienced learners, and of a community of learners who have, among them, significant practical expertise in the area of the course. It would be of interest to see whether less experienced learners were as comfortable with independent learning.

The level of helpfulness shown in the messages gave a strong sense of community within the conferences. The tone and phrasing of students' responses was consistently friendly and sympathetic. This supportive atmosphere was conducive to openness and honesty among students. It helped students to reveal their problems and misunderstandings without fear of embarrassment. The feeling of empathy and community provided the best possible environment for students to learn from each other.

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