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Littleton and Whitelock

**The negotiation and co-construction of meaning and understanding within  
a postgraduate on-line learning community**

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## Littleton and Whitelock

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## **1. Abstract**

There is an increasing development of courses and course components taught through teaching and learning dialogues online yet there is little secure knowledge regarding the educational quality of these dialogues. Drawing on contemporary socio-cultural research, this paper adapts a well-established analytical framework (see Mercer, 1995) that has been developed to understand face-to-face educational dialogues to the context of asynchronous electronic conferencing. The work reported is derived from an in-depth case study of a tutorial group of 11 students enrolled on a course within the Open University's MA in Open and Distance Learning. The course was taught on-line to an international cohort of students from wide-ranging academic backgrounds. The analyses of electronic conference archives presented here focus on understanding the students' on-line collaborative work and the ways in which they constructed meaning, negotiated shared understanding and supported each other in the process of learning at a distance. The implications of the findings for educational practice are considered.

## 2. Introduction

For students involved in earlier generations of distance and open education, regular opportunities for collaborative and co-operative work were simply not available. However, human history is characterised by technological innovation and change, and developments in computer technology now enable learners studying at a distance to participate in ongoing learning ‘conversations’ with other students, sharing interests and commitments. For example, through participation in networked conferencing environments, students are potentially able to actively construct knowledge and understanding through discussions with their tutor and peers - ideas are shared with others and built upon through their reactions and responses. ‘E-learning thus expands the rich tradition of independent study associated with earlier generations of distance education and provides and often mandates a variety of synchronous and a-synchronous learning activities’ (Garrison & Anderson, 2003, p. 44). One of the challenges for open and distance educators is thus to ensure that learners have the opportunity to engage in productive computer-mediated interactive learning experiences that enable them to interact meaningfully with others in developing knowledge and understanding. Interaction with peers and with tutors now sits at the very heart of the distance and open educational process.

The challenges associated with the use of computer-mediated communication (CMC) by distance education students are well documented. For example, in a study of Open University students using a CMC system as part of an Arts course, only a third could be classified as actively participating (Mason, 1995). Similarly in another study of 3000 on-line technology students, in any one month only about one hundred learners were active contributors to the CMC-based discussions (Morris & Naughton, 1999). Interestingly, similar low participation rates are reported across a range of CMC experiences (Tolmie & Boyle, 2000).

Yet despite these problems, many researchers point to the potential pedagogical benefits of CMC, particularly for promoting collaborative learning. For instance, Tolmie and Boyle (2000) maintain that the value of asynchronous communication is not just that it facilitates discussion between students, but that ‘any disagreements which occur will promote growth in understanding’ (p. 121). Whilst there is evidence that students often

learn vicariously, by observing other people's discussions (McKendree, Stenning, Mayes, Lee & Cox, 1998), it has also been suggested that CMC systems can be used to improve students' argumentation skills, for example by reviewing arguments. In discussing the importance of argumentation, Reader and Joinson (1998) point out that that what students usually take from a tutorial discussion are just the conclusions, which are what seem to be important. Of greater pedagogical importance, however, is an understanding of the actual processes that led to these conclusions (McKendree *et al*, 1998). The suggestion then is that the advent of CMC should bring with it a sense of an academic discipline as process rather than product, thereby promoting a shift away from a 'school ethos' (Light *et al*, 2000). Challenging existing conceptions of the processes of teaching and learning is a recurrent theme in studies of CMC. The emphasis is on the desirability of moving away from established 'delivery' models of education so that the 'task becomes that of structuring challenging conversations among a community of learners rather than channelling expertise or knowledge to the student' (Light, Light, Nesbitt & Harnad, 2000 p. 199).

This emphasis on the importance of interaction for learning is one that is reflected in the wider educational research literature and the notion that knowledge and understanding are constituted in and through interaction has considerable currency. Moreover, there is a growing body of work which emphasises the need to study and understand the dynamic processes involved in the joint creation of meaning, knowledge and understanding (e.g. Grossen & Bachmann 2000; Murphy, 2000; Littleton, Miell & Faulkner, 2004; Miell & Littleton, 2004). It is also argued that research should establish how 'personal meanings and understanding are created, negotiated and enriched within interpersonal exchanges' (Crook, 1999a, p.369) situated in specific institutional and cultural contexts. This is an important research endeavour, not least because developing our understanding of such processes has important implications for pedagogical development and instructional design and intervention.

Thus, influenced in part by the literature concerning the potential pedagogical benefits of CMC and the broader literature concerning the social processes of learning, we undertook a detailed case study of an on-line tutorial group, who worked together over an academic year, in order to elucidate the processes involved in teaching and learning on line. Our initial analytic work focused on understanding the processes through

which the tutor guides the creation of knowledge and understanding by the group members (see Littleton & Whitelock, 2004). We thus recognise the pivotal role that the tutor plays in helping students establish common knowledge – a joint, shared version of educational knowledge. In this paper, however, the emphasis is on the processes involved in the students' on-line interaction with other students and specifically the ways in which meaning and understanding is negotiated and constructed between them during their participation in a FirstClass conference.

### **3. The Course Context: H801 - Foundations of Open and Distance Education**

Our work has focused on developing an understanding of the course-related computer-conferencing activities of one tutorial group, studying H801 *Foundations of Open and Distance Education*, over an academic year. H801 formed Year 1 of the Open University's MA in Open and Distance Education and constituted 60 points of the 180 points required for the award. Assessment of the course was by continuous assessment and the submission of a project proposal (the examinable component). At the start of the academic year thirty-three students were registered on the module. Each student was allocated to one of three tutorial groups, each group being supported by a different tutor. Students studied the course in four blocks, each block representing between 110-150 study hours. The topics covered were: the theory and practice of open and distance education, teaching and learning in open and distance education, researching the literature on open and distance education and research and evaluation methods in open and distance education. For each block the students received a large loose-leaf folder containing the study guide, selected readings and other items. They were also sent set books and audio-visual materials to study. Throughout the course the students kept personal electronic workbooks and contributed to a centrally provided interactive bulletin board/electronic workbook over the web. The students submitted and received marked TMAs (tutor marked assignments) electronically (via e-mail) and they were required to participate in tutor-supported computer conferences at the end of each section within each block. These asynchronous conferences, which were held between the members of each tutorial group, were designed not only to provide support for students in their studies, but also formed a crucial part of their preparation for TMAs. Two of the five TMAs for the course required students to incorporate aspects of their group's conference discussions within their responses to the questions set. For the other

three assignments students were advised that, whilst there was no obligation to draw on the discussions of their electronic conference when preparing their answers, they would find it valuable to do so. Note too that the students were free to access (but not participate in) other tutor group conferences. So they were able to draw upon the discussions of other tutor groups where relevant. The intention was not to 'reward' students for simply contributing to the discussion, rather the students were given credit for the way they drew on the conference discussions, together with other sources, to demonstrate their understanding of the issues raised in the course material. A crucial feature of H801 was the development of students' understanding of learning at a distance via the 'emphasis on critical reflection on content' (Hawkrigde 2001, p.8) and the promotion of discussions between students regarding how they themselves learn.

In the electronic tutor group we studied there were 11 students (4 females 7 males). 7 of these students were based in the UK. 1 student was based in Luxembourg, 1 was based in Hong Kong, 1 in the United Arab Emirates and 1 in Zimbabwe. The 11 students were from diverse academic backgrounds, but all were professionals involved in, or taking a career break from, education - many of whom were taking the course as part of their continuing professional development. The tutor, who supported the students' learning across the year, was a highly experienced distance educator who had been involved in the conceptualisation, design and authoring of H801. All participants in the conference gave permission for their conference discussions to be archived in their entirety and analysed for research purposes. Analyses of the messages within this archive are presented here. Pseudonyms are used to ensure anonymity.

As the figures presented in Table 1 indicate, overall 72% of the total postings to the H801 conference are made by students and the tutor's postings represent 28% of the total contributions. Clearly in the case of sub-conferences where student participation is lower, the relative proportion of tutor/student input appears to be proportionally higher.

Table 1 about here

Our primary research interest in the context of this paper was in how the students engaged in the processes of joint knowledge construction within the context of the

H801 FirstClass conferencing environment. Specifically, we were interested in the ways in which the students responded to and built on each other's contributions.

#### **4. Methodological Approach**

Our methodological approach to investigating how the students created knowledge and understanding together took as its starting point contemporary socio-cultural theory and research, in particular the characterisation of peer-based knowledge building through interaction developed by our colleague and socio-cultural researcher Neil Mercer (see, for example, Mercer, 1995; Mercer 2000). This work, which was initially developed in the context of examining interaction between groups working at computers rather than interacting through them, offers a characterisation of three social modes of thinking – namely modes which are disputational, cumulative and exploratory in nature. The disputational mode of interaction is characterised by disagreement and individualism, there being few attempts to pool resources or offer constructive critique of suggestions. Assertions, counter-assertions and challenges are made. In the cumulative mode, learners build uncritically and positively on what others have contributed. Shared understanding is developed through a process of accumulation and accretion. So there is evidence of repetition, confirmation and elaboration in the interaction. Finally, the exploratory mode is evident when partners engage critically but constructively with each other's ideas. As Mercer (1995, p. 104) explains: 'statements and suggestions are offered for joint consideration. These may be challenged and counter-challenged but challenges are justified and alternative hypotheses are offered. Compared with the other two modes knowledge is made more publicly accountable and reasoning is more visible. Progress then emerges from the eventual joint agreement reached.' It is because of its emphasis on the visible pursuit of rationality, that Mercer suggests that the exploratory mode of interaction is the most productive form of collaborative interaction in educational settings, particularly although not exclusively in the context of joint problem-solving. In his writings Mercer is clear that this characterisation of social modes of thinking is not intended to represent a descriptive categorical coding scheme into which all speech can coded. Rather, the modes are offered as analytic typologies – typifications of the ways in which learners think together (Mercer, 1995, p.104).

Mercer's conceptualisation of the different modes of interaction was generated by a theory of language and cognition which is essentially socio-cultural, and which identifies a developed capacity for the joint creation of knowledge between contemporaries and across generations, as a crucial and distinctive psychological characteristic of our species (Mercer, 1995). This theory incorporates a strong interpretation of the significance of *context*, which here means that interaction which resembles any one of the three types — Disputational, Cumulative, and Exploratory — may be socially appropriate and effective in some specific social contexts. But the theory also suggests that the kind of interaction which (following Barnes & Todd, 1978; 1995) Mercer calls 'Exploratory' represents a *distinctive social mode of thinking* — a way of using language which is not only the embodiment of critical thinking, but which is also essential for successful participation in 'educated' communities of discourse (such as those associated with the practice of law, science, technology, the arts, business administration and politics). Of course, there is much more involved in participating in an educated discourse than using language in an 'exploratory' way: the accumulated knowledge, the specialised vocabulary and other linguistic conventions of any particular discourse community have to be learned, and account has to be taken of members' relative status and power. There are also limits on how explicit members of a discourse community need to be to make meanings clear: they can share new ideas explicitly enough to be effective by implicitly invoking the community's shared knowledge and understanding. A key judgement made by effective communicators within a discourse is about what issues need to be made explicit to any particular audience on any particular occasion. Nevertheless, the exploratory mode of interaction embodies qualities that are a vital, basic part of many educated discourses and is a communicative process for reasoning together in the context of some specific joint educational activity.

Following Mercer's (1995; 2000) socio-cultural analytic approach, we jointly undertook detailed qualitative analyses of the entire conference archive, aiming to understand more about the processes through which the students negotiated and constructed their knowledge and understanding. The emphasis in the research reported here thus differs from the work of discursive psychologists who stress the importance of discursive resources such as interpretative repertoires (e.g. Edley, 2001; Potter & Wetherell, 1987). Socio-cultural discourse analysis also differs from 'linguistic' discourse analysis in being less concerned with the organizational structure of language, and more with its content,

function and the ways shared understanding is developed, in social context, over time (Mercer, Littleton & Wegerif, 2004). Like conversation analysis, socio-cultural discourse analysis is concerned to understand how meanings are co-constructed in interaction. However, quite apart from the interest here being on-line data rather than naturally occurring talk, there are key differences in terms of analytic approach and the associated level of granularity. For example, socio-cultural discourse analysis does not focus specifically on the close details of turn-taking, as in conversation analysis (e.g. Wooffitt, 2001), neither does it confine itself to a 'word by word' level of analysis. Rather, the analysis of modes moves between the detail of specific contributions and the broader meanings recognisable in more extended sections of interaction.

Our analytic work therefore involved close readings of the on-line interactions to understand how the students were using written language as a tool for thinking together. In making that analysis the definition of the exploratory mode of interaction, as described earlier, served as an 'ideal type' a typification of reasoning embodied in interaction. The features of the three types of interaction described earlier were thus used as a key frame for considering the nature of the students' interaction.

## **5. Results**

Our analyses indicated that the students' contributions were positive and constructive in nature and there was no evidence of the students engaging in disputational interaction. Not all the postings to the conference were concerned with knowledge building and constructing understanding, some were clearly to do with, for example, 'administrative issues' such as confirming TMA submission dates or technical issues. But where the students were engaged in course-related discussion, our analyses revealed evidence of both cumulative and exploratory interaction. The most prevalent type of interaction was cumulative, involving the building of knowledge and understanding through accretion.

A common form of 'cumulative' posting to the conference, illustrated in Extracts 1, 2, and 3, involved students posting a brief message sharing details of useful references and other source materials, perhaps adding to previously pooled resources.

Extract 1:

*one useful addition to the existing suggestions, thanks for these...  
a general search through google revealed this site: 'Distance Learning Resources':  
<http://stlinux.oubk.edu.bk/logic/distance.htm>*

Extract 2:

*...I am trying not to focus on our home institution or similar models but a mix...however the  
IGNOU-ICDE Site has a number of useful papers regarding evaluating learner services and  
interactive media – here's the URL  
<http://www.cemca.org/ignou-icde/index.html>*

Extract 3:

*I found this via H80X Resources by searching for Web-based. Not all the links work but it  
may be of some use if not now then in the future.  
<http://www.outreach.utk.edu/weblearning/default.htm>*

These messages and others like them often occurred in the context of specific TMA-related discussions by the group. Such postings were not limited solely to initial discussions or 'brainstorms' by the group. They also appeared as and when students found material of relevance. Students occasionally posted items simply because they found them interesting and wanted to bring them to the attention of the others, even though it might not be closely related to the current line of discussion - see Extract 4.

Extract 4:

*Hi  
I found this item about the so called diploma mills and fake degrees. I know it's not directly  
concerned with web-based courses but some may find it of interest. The site is  
<http://www.umiversitybusiness.com/0003/diploma.htm>*

*I apologise if this is a wrong posting. I don't mean to hijack the discussion :o) I just found it interesting.*

Another form of cumulative posting involved students commenting on each other's contributions by suggesting further issues for consideration – this can be seen in Extract 5 which is taken from a point in the conference where the students are working towards their second TMA. The group are discussing the proposition that: 'detailed knowledge of the characteristics of her/his learners helps the open and distance educator to teach them'. As part of the discussion Ellice posts a lengthy message in which she concludes:

Extract 5:

*...Currently, the majority of courses adopt a multi-media approach and with more use of video's, computers and e-mail this will increase. Therefore is it really necessary for educators to know if learners prefer a 'single mode' approach? Distance educators should be attempting to devise ways in which learners can access the appropriate technology.*

Rick then posts a message responding to this commenting:

*I don't think that it is important whether teachers know which students like a single or double mode approach. The important point is that in the course they offer the student choice. These materials should offer many different ways of working through the course.*

*Just a thought.*

*Rick*

In his response Rick orientates to Ellice's implied challenge to the suggestion that it is important that educators know if learners prefer a particular approach, commenting that he feels that 'it is not important whether teachers know which students like a single or double approach'. He then goes on to add that what he feels is important is that a course affords student choice and different ways of working through the course. Rick's contribution thus confirms Ellice's querying of the importance of educators understanding students' preferences and also adds to the debate through accumulation

introducing the notions of choice and diversity into the debate. In posting these messages Ellice and Rick offer their perspectives on the topic but the reasoning or evidence base underpinning their positions is not presented. It is not clear why access is the crucial issue or why diversity and student choice are important points. So whilst they have made their perspectives visible and thus to some degree publicly accountable, the reasoning underpinning their arguments is not made clear.

In many postings the students offered brief critiques of each other's ideas comprising suggestions for additional points to include. For example, in Extract 6 we see Ellice responding to a lengthy message from Julie in which she posted her reflections on the New Zealand Correspondence School and its use of innovative multi-media for supporting students' learning.

Extract 6:

*Julie, your reflection of OD ed. In NZ seems thorough and you highlight some positive aspects – quick feedback, reducing feelings of isolation, developing relationships-personal letters. It might be worth highlighting feedback from learners especially how they value face to face contact, are visits from tutors, residential seen as important. I'm afraid I can't offer any suggestions for proposed change – my brain's a bit fuddled – it's 1am and I need to get to bed – must get benefit of breakfast in bed tomorrow – a shared mother's day & daughter's birthday!*  
*What's your 4 year old like at doing breakfast in bed?*  
*Hope you have a great Mother's day.*  
*Regards Ellice.*

In this message there is clearly a degree of critical engagement with ideas, which is reflected in the suggestion of further points for inclusion. Ideas are thus being developed through accumulation, although the critique embedded in the response presented here does not embody the qualities of the exploratory mode of interaction as characterised by Mercer. As was the case in Extract 5, reasons for the suggestions made are not given and the message seems to operate on implicit concerns with solidarity (Mercer, 1995, p.105) and soon moves from critique to the personal. Clearly time constraints are alluded to and it might indeed be the case that issues of time impact on the nature of the students' contributions. Yet the frequent use of cumulative types of

interaction may also in part reflect the fact that many students felt slightly nervous about opening up their reasoning to the other participants in the conference or commenting on others' ideas. Contributions to the conference were often accompanied by the comment, as seen in Extract 5, that they 'were just a thought' or that the ideas were being advanced tentatively or without much prior thought – a kind of gut reaction or as 'initial thoughts – nothing too deep'. Furthermore, messages were occasionally headed up in such a way as to indicate this – for example 'a shaky start' or 'An idea...but...'. In most cases such qualifications did not seem to accurately reflect the quality of the ideas presented within the message, rather they seemed to be being used as a kind of 'safe-guard' in case others' reactions to the posting were not favourable.

Whilst the students' interactions were friendly and supportive, and the tenor of the messages positive, the students nevertheless expressed anxieties and concerns in relation to their own participation in and contributions to the conference. Such anxieties are discussed at length by the students when they post responses to a message from Ellice offering reflections on her own engagement with the conference. In her message Ellice comments on the importance of students participating in a 'full and meaningful way' for conferencing to be a 'worthwhile learning device' and the issue of confidence. Ravi responds to Ellice's posting with the message reproduced as Extract 7:

Extract 7:

*I have found problems with this mainly to do with confidence. I have felt at times as if my contributions haven't been carefully thought through; they have been immediate reactions to a message (rather like this one). Also if nobody replies it has made me feel that my contribution wasn't worthwhile. I know that this is not the case as I have gained much from reading messages without necessarily replying. Sign of a dependent learner I suppose! Bizarrely, I have also felt that I have contributed too much at times! All a kind of computer conference shyness I think. I enjoyed reading your message, Ellice. It is interesting to see another person's view of the same experience. Good luck with the TMA.*

Julie also responds with the message reproduced in Extract 8.

Extract 8:

*Re your message Ellice. I agree that confidence could be an issue in successful use of conference debate. Reading other people's contributions can make your own seem very 'weak' in comparison. Insecurity can also increase if no one replies to your message or if you have to wait some time for a reply. It's a useful forum for an exchange of ideas and given the distance element perhaps the only practical one.*

Issues of confidence, identity, self-presentation and social comparison clearly loomed large and were of paramount importance to these students. The students were very sensitive to their own ability and the quality of their contributions relative to their peers. Messages appeared to be being used as a source of informal feedback - as a means of gauging 'where everyone is at'. Such social comparison is unsurprising. From a very early age learners are highly skilled at making sense of educational contexts and activities. They construct and participate in discourses about ability and effort (Bird, 1994) and are motivated to understand what it means to be a learner and what it means to do and succeed at educational tasks. The social climate of comparison, competition, success, failure and issues of relative status and ability in the classroom rapidly become established within the early years of schooling (Crocker & Cheesman, 1988) and remains with students throughout their educational careers.

The nervousness regarding the risk of being perceived as offering weak or worthless contributions' has the potential to be a powerful inhibitor of on-line collaboration. Perhaps in recognition of this, the students, and also the tutor (see Whitelock & Littleton, 2004), actively worked to foster an inclusive learning environment, in which there was an attitude of respect towards other learners' contributions. Messages encouraging others to participate were often slightly jokey and/or were accompanied by the presence of emoticons such as smileys (see Extract 9), perhaps in an attempt to establish a 'lighter' atmosphere in which people felt able to contribute.

Extract 9:

*I have found a good web-site about evaluating internet-based learning.*

[http://www.isoc.org.isoc/whatis/conferences/inet/96/proceedings/c1/c1\\_4.htm](http://www.isoc.org.isoc/whatis/conferences/inet/96/proceedings/c1/c1_4.htm)

*Gives some good advice and some good links, has a small section on learning styles. A good overview. Another one*

<http://www.scis.nova.edu/benkeb/story1.htm>

*This is evaluating web design which is a different slant on it.*

*I have copied and pasted the URL's into this post so I know they work.*

*Well, that is my contribution, so why not someone else have a go, come on grasp the rodent and let's go :0)*

As others before us have recognised (e.g. Bonk, Wisner & Nigrelli, 2004), it was also the case that devices such as self-disclosure, sharing events and emotional experiences played a pivotal role in the development of peer relationships on-line and fostering the sense of being part of a community of learners. Extract 6 provides an example of such disclosure, and demonstrates how the participants in the conference would manage shifts in their modes of interaction within a single message, with processes of community building going hand-in hand with and implicated in knowledge building. Students' were concerned not to inadvertently 'offend' others. In Extract 4 we saw that the contributor was keen to clarify that his posting was not intended to 'hijack the discussion'. This concern not to offend may also influence the authoring of messages for posting, the result being that where the interaction was exploratory in nature challenges to each other's ideas were carefully handled and often pursued through the strategy of questioning. Use of this strategy can be seen in Extract 10 where two messages taken from an extended discussion about the notion of 'openness'. Note that such exploratory forms of interaction only became prevalent a few months into the conference discussions

Extract 10:

*I tried to post a message yesterday but we're having enormous technical problems in work so I'm on a different system & will try again. How frustrating & time consuming!! Ok to start with open education I guess that we musn't assume that just because the word 'open' is in a title that it actually is. Isn't open learning more an approach to learning? Any definition will perhaps be a value judgement. In Lucy's case it's open to the public – but even then it will depend on times of opening – are certain people excluded because of these times? In the context of the OU I see the aim as being to open up education & would say that it has succeeded in*

*doing so. Open in the sense that no qualifications are required for the undergraduate courses; our course isn't open in this respect but isn't education by its very nature elitist?*

*I would agree with Roger Lewis and Leslie MacDonald (1988) that its about helping individuals to take responsibility for their own learning. And of course there's always Juler's quote that has already been mentioned.*

*If we go back to opening up opportunities then we've got to look at all the socio-economic, cultural factors etc which will come into play. On distance education with its origins in correspondence education how much have new technologies opened it up? Do you think the OU is more open now than in 1993 Rick? It must surely be available to more people & has it improved the communication front. Technology is wonderful when it is working well – network problems at work - now involving engineers in America – have caused me no end of problems over the last week. Has the opening up of new markets overseas for the OU actually become a vehicle for serving financial ends? Certainly for many institutions the distance education route is seen as a money saver. Distance educators will always be constrained by institutional constraints. A definition of distance education will also depend on which part of the world you live in – again the influence of other factors at play. Anyway I'm afraid I am out of time – once again. I only hope this message gets through as I don't have a rough draft anywhere Bad planning!). Look forward to more of your comments  
Julie.*

Rick replies

*Hi Julie*

*Julie wrote Isn't open learning more an approach to learning? And Do you think the OU is more open now than in 1993 Rick?*

*I think where the Open University has become more open is in the use of modules. Students can tailor their study to their own interests and needs. I wonder if the use of named degrees will change that and restrict the student's choice of modules? I know in my university, students do not have a choice in what they study. We are bound by the professions we supply people the people for nurses, physios etc. They have to study certain materials and the professional bodies also state how many hours we have to teach the students.*

*Also, Julie, it is getting down to what we mean by being open. As I mentioned earlier we have a timetable to study, assignments to get in on time, material that has to be studied before then. How open is that? Yes we can decide when we study, but isn't that determined by our work, family and social commitments also? I know I fit in what study I can, but do I truly choose the times? This is getting philosophical. Who gets to keep control.....*

*The message continued for two further paragraphs and ended*

*Julie Just a tip. I write all my comments in MS Word and paste them into the discussion reply box. I also have this fear of writing a great piece of rhetoric and then find I lose it in the posting.*

In this extract we can see an exploratory mode of interaction beginning to unfold. Julie challenges Lucy's previously posted definition of openness as being about 'being open to the public' through raising the issue of times of opening as a proviso, questioning whether certain people are excluded because of this. She then goes on to outline her own take on openness, drawing on relevant course materials and in that context asks Rick whether the OU is more open now than in 1993, reflecting on the potential role technology may play. Rick's reply provides his response to the question posed and also indicates to Julie that it 'get's down to what is meant by being open' – and he challenges her contention that the OU has succeeded in being open pointing to the strict time-table of study and the demands made by assignments. Note that both students comment on the process of drafting their postings implying that much care and attention is paid to crafting these kinds of contribution.

In addition to the cumulative and exploratory modes of relating, we also identified a peer-tutoring type of interaction, which was not captured within the typology of talk that initially informed the analyses. Peer-tutoring postings typically occurred as a response to a posting in which a group member raised question(s) or issues and/or explicitly requested clarification and/or assistance from others in the group – as in Extract 11.

Extract 11:

*Sorry I have taken so long to get into the swing of things my computer was struck by lightning and it kind of put me off.*

*This TMA seems to be talking about two related but different things in each part. In part one, the focus is on 'distance taught courses', and part two looks at web-based courses. There is no indication that the 'distance taught courses' have to be web-based, only that they should be relevant to our subject area. (or have I got that wrong?)*

*Anyway I am gradually finding a sufficient amount of information on one particular educational organisation – The University of Dundee – but I am unsure how I can evaluate their courses (or any course) without seeing the course material. Does anyone have any comments or helpful hints in that area?*

*I have included a file which I don't expect will be particularly relevant to anyone who isn't researching the same subject as me, (nursing/ health/ medical related distance taught courses) but it is an example of the kind of information that is available. (I have only included part of what I have found out about this particular course/ set of courses). But how do I evaluate a course when I can't see any of the material on offer? Or should I be looking at web based distance taught courses? If so, I can't find any in this subject area.*

*Any ideas?*

*Lucy*

Julie then replies:

*Hi Lucy*

*As I've understood Part 1 we use the Web as a search tool to find out about courses in our subject area. Not all, if any of these courses will be Web-based – they may just be advertised via the Web. As a starting point for evaluation look at the course description provided on the site – if there isn't one you can't evaluate it!*

*Do you think the course can deliver on the basis of its description? Is there any info about learner support, methods used, materials, assignments etc. Is the course using familiar texts or does it look innovative?*

*Just some ideas which may or may not be of help.*

*Part 2 is trick as you have to find 3 eggs & if you're struggling in your subject area.....you need to define web-based, lots of courses claim to be web-based but in actual fact they make little or no use of the Web.*

*I'll think about it and get back to you.*

*Good luck!*

Julie's response to Lucy's posting demonstrates many of the features associated with instructional forms of interaction. For example, she offers an elaboration of the requirements of parts 1 and 2 of the TMA, she poses questions to help Lucy consider how she might set about her evaluation and she also problematises the term 'web-based', prompting Lucy to consider how she might define this term. Note, that the comment 'Just some ideas which may or may not be of help' seem to suggest that Julie is keen to signal that her approach need not necessarily be followed, the ideas are offered as suggestions rather than prescriptions.

## **6. Discussion**

The analyses presented above suggest that the students participating in the H801 conference engaged in discussion of ideas and exchanged perspectives and information. Learners predominantly engaged in a cumulative social mode of thinking where knowledge was constructed largely through accumulation and accretion. This seemed to serve a valuable function within the conference enabling the sharing of resources and the sharing and pooling of ideas as well as the development of ideas through the highlighting of further issues for consideration. Mercer's typology emphasises the crucial significance of exploratory interaction in educational contexts. In this on-line environment, however, cumulative interaction had a pivotal role to play in establishing common ground between the participants. It also seemed to represent a 'way into' investigating ideas through and in interaction with others and may have had a key role in helping students develop their on-line interaction strategies and styles. As the conference progressed, there was also evidence of students engaging in an exploratory mode of interaction (although to a lesser degree than the cumulative mode). This exploratory type of interaction involved the students in sustained, constructively critical engagement with each others' ideas and in making challenges and counter-challenges. There was also evidence of postings in which peer-tutoring occurred. This tutoring style

of interaction, which is not represented in Mercer's typology, was undertaken by those students who were confident users of the conferencing medium. The issue of confidence proved to be an important one, for whilst the emotional tenor of the messages was supportive throughout the conference, some students displayed and expressed anxieties concerning the nature of their own intellectual contributions and also made reference to a process of drafting their more extended 'rhetorical' pieces. As noted above, the students we studied were largely building knowledge through processes of accumulation and accretion. Whilst there was evidence of them engaging in an exploratory mode of interaction, this way of interacting did not predominate. Our work thus suggests that there may be scope for developing ways of supporting post-graduate students to develop their on-line discussions, such that they become more exploratory in nature. Clearly we recognise the value of cumulative discourse, and do not want to diminish its significance in this context. However, it is also important to recognise that these students were working at Masters' level and that they were therefore expected to be refining and developing their skills of critical evaluation and argumentation, which were in turn assessed in the context of their written assessments.

The difficulty of encouraging extended course-related discussion and debate in conferencing environments has often been noted by other writers, for example, Mason writing in 1991 comments on the inability of even the most and diligent and enthusiastic tutors to stimulate sustained interactive discussion. Yet interacting comfortably in educationally productive ways does not simply happen by chance. Evidence from studies undertaken in face to face settings suggest that careful consideration needs to be given to how students are inducted into ways of working together, and that this should involve careful attention to the generation and the establishment of jointly constructed and mutually agreed 'ground-rules for discourse'.

Learners need to learn how to learn together in conferencing environments. That is, they need to learn to collaborate effectively as well as collaborate to learn. The key to further enabling the interactional processes involved in the construction of knowledge is the creation of a positive culture of collaboration and community of enquiry. Such a culture of collaboration is founded on mutual respect and trust amongst tutors and learners - such that learners feel able to take the risks inherent in opening up their thinking to their peer group (Underwood & Underwood, 1999). The emphasis on the

importance of enquiry, stresses the value of discussions and negotiations, and the proposal, criticism and acceptance or rejection of ideas and hypotheses (Elbers & Streefland, 2000). The debate and discussion of ideas may at times involve some dispute and disagreement, as in the exploratory mode of interaction, but this is undertaken in an environment of trust in which personal criticism has been and is clearly distinguished from the criticism of ideas.

The importance of learning how to interact in conferencing environments should not be under-estimated. It is possible that *how* a learner engages and interacts with others may potentially have a more profound and enduring impact on their circumstances than the acquisition of a better understanding of (for example) theoretical frameworks relevant to open and distance education. It is vital therefore that we give careful consideration to the issue of how we help learners make sense of their computer-mediated learning environment with its associated routines, rituals and discourses. Whilst there is a strong expectation that learners will work and interact together, it is rare that they are actually explicitly inducted into educationally effective ways of doing this. We thus suggest that unless learners are helped to feel comfortable with and recognise the demands and expectations associated with teaching-learning interactions on-line, access to valuable learning opportunities may be curtailed or limited. Furthermore, it is our assertion that until learners are supported to use written language as a resource for negotiation with others, the full potential of the First Class conference experience may remain unrealised. Writers such as Riel (1995) see the potential of computer-mediated communication technology in terms of changing the role of the tutor from controlling the transmission of knowledge to providing intellectual leadership in challenging conversations among a community of learners. Yet the responses of students such as Julie and Ravi suggest that students are very sensitive to the quality of their intellectual contributions and without explicit induction into relevant discursive practices, some students may not benefit fully from participation in such learning conversations, and indeed, given the climate of comparison alluded to by some of the students in this study, the experience may be detrimental to learning rather than enabling. It is vital that students are helped to appreciate both the affordances and the limitations of the electronic medium and are involved in explicit discussion and reflection, rooted in their own experience, of what constitutes productive interaction on-line. Explicit consideration of the typology

outlined here may usefully be deployed as a way of further resourcing any such discussion, and also training tutors.

However, seen from this perspective it would not be sufficient simply to consider an initial induction of students early on in the course, rather the process needs to be embedded in practice and the tutor would need to act as a discourse guide, mentoring the students' initiation into specific culturally based discourse practices, for example, by modelling in their own contributions how to interact in an exploratory way. As Garrison and Anderson note, '...facilitating discourse for the purpose of building understanding goes to the heart of the e-learning experience. Facilitating discourse recognises the role of the community of enquiry as enabling and encouraging the construction of personal meaning as well as shaping and confirming mutual understanding. This element represents the fusion of purpose, process and outcome. It is where interest, engagement and learning converge' (p.68).

A concern to promote productive interaction sits at the heart of our work and we recognise that the processes of knowledge construction are inextricably interwoven with the construction of social understanding and the experience of being a learner participating in the ongoing life of the academic community. Work based on the analysis of archived conference contributions, such as those presented here afford only a partial, and arguably somewhat limited, understanding of teaching-learning processes on-line. It is thus imperative that researchers investigate 'learners' accounts of their learning-teaching experiences. Our ongoing research is thus exploring, through in-depth interviews, students' experiences of asynchronous collaboration and teaching-learning on-line. Researching 'insider' perspectives (Storey & Joubert, 2004) on the processes of collaborative learning is thus vital. Not only are such perspectives and accounts important in their own right, but they can also be used to resource and inform researchers' interpretations of on-line teaching-learning interactions.

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**Table 1: Student/tutor contributions by H801 sub conference**

<b>Conference Name</b>	<b>Total number of messages</b>	<b>Number of tutor messages</b>	<b>% Messages contributed by students</b>	<b>% Messages contributed by tutor</b>
H801 Des's Group	82	14	83	17
H801 DGH5 TMA01 Part 1	47	9	81	19
H801 DGH5 TMA01 Part 2	37	11	70	30
H801 DGH5 Part 1 For	12	3	75	25
H801 DGH5 Part 1 Against	10	3	70	30
H801 DGH5 Part 2	3	0	100	0
H801 DGH5 Workshop 03	6	2	67	33
H801 DGH5 Orientations	9	5	44	56
H801 DGH5 3 Ellie Qs	17	9	47	53
H801 DGH5 Part 1	10	4	60	40
H801 DGH5 TMA03 Part 2	2	1	50	50
H801 DGH5 Workshop 04 Part 1	29	9	69	31
H801 DGH5 Workshop 04 Part 2	3	2	33	67
H801 DGH5 Workshop 05	34	12	65	35

