Chapter 42

Technologies in use: how context and design drive their effects[1]

1.1 Introduction

Computer conferencing has been widely advocated as a desirable application of ICT in universities, because dialogue and discussion are associated with high level learning outcomes (Laurillard, 2002) and because it enables the social context for learning to be extended into the virtual environment. The assumptions on which this advocacy rests relate to the radical shifts in thinking about learning promulgated by researchers drawing on the work of Vygotsky and Leontiev on activity and learning. Brown, Collins and Duguid (1989, p.32) elaborated the idea of situated cognition as an approach which avoids the separation of what is learned from how it is learned. They argued'*…the activity in which knowledge is developed and deployed…is not separable from or ancillary to learning and cognition. Nor is it neutral. Rather it is an integral part of what is learned. Situations might be said to co-produce knowledge through activity. Learning and cognition… are fundamentally situated.'*

There is a growing number of ways in which learners can interact with each other and with a range of more expert or experienced others, through the Web, thus constructing a social context for their learning in a virtual environment. However, experience of the use of asynchronous conferencing demonstrates that it has not proved to be a tool which easily delivers the learning benefits that in theory it promises. The literature on its use includes both enthusiastic promotion and disappointed critique (Kear, 2004, Ahern et al, 2006). Some have found that it enables valuable discussion (Leach, 2001, 2002) or claim that communities have formed (Putz and Arnold, 2001). However some teachers have also been

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disappointed in the low number of users of conferencing on their courses and in the quality of interaction which has not developed skills in argumentation or knowledge construction (McAlister, 2004).

This conflicting evidence is not a helpful starting point for teachers looking for guidance in how best to use computer conferencing. We recently undertook research into a variety of forms of interaction, including computer conferencing, in order to identify its impact on the quality of student learning and to be able to provide better-grounded evidence of its impact (Thorpe and Godwin, 2006). This paper describes the contrasting experiences of students on three courses that were judged to be similar in terms of computer conferencing, yet which had very different impacts on student take up and response. We discuss the reasons for this and reflect on the implications for teaching.

2.1 The Research Method

A number of OU courses were identified as incorporating extensive use of computer conferencing that was integrated into the teaching design of the course (Thorpe and Godwin, 2006). These courses were therefore perceived to be similar, in terms of offering students a high degree of interpersonal interaction that played an important role in the achievement of the learning outcomes of the course. It was important to include both interaction and its integration into the teaching, based on earlier research demonstrating that students often choose not to use technologies if these are not incorporated into the assessment of the course (Kirkwood and Price, 2005). A survey of a random sample of students on these courses was undertaken in 2004 and this generated a large volume of open-ended comments by students on the benefits and disadvantages of conferencing on their course. The researchers then undertook more in-depth study of three courses, using a mix of telephone interviews, email interviews and participant observation.

3.1 Case study 1: structured, task-specific conferencing, assignment marks allocated

Case Study 1 is a core course in the BSc Environmental Science, recruiting c420 students annually. Half of the 600 hours total study time requires use of a computer for both individual and group learning activities. Students log onto the course website and work through the online activities. All have to participate in an online debate in weeks 3 to 5 of the course, and 35% of the marks for the first assignment are allocated for commentary on the group process and the student's reflection on their own role in the interaction. In the second assignment, 30% of the marks are given for summarising a second group debate on strategies for preserving areas of

biodiversity, with detailed guidance on what aspects to cover. If no consensus was reached, students are required to explain why. These assignments cannot be completed therefore if the student has not participated and made at least some direct contribution.

The design of these activities is very clearly structured and specified by the course team. Students work individually at first, finding and evaluating data about a small island state allocated to them by their tutor. They must draft short assessments of this data and submit an assessment of their own island before the discussion with their tutor group. The tutor group of c20 students must then complete a task online collaboratively, which is to draft a statement as from the Association of Small Island States (AOSIS) to the UN, making proposals for action in the interests of AOSIS and demands for compensation. This requires them to discuss what should be in the statement from the perspective of their own island and how best to accommodate all the needs of AOSIS in the draft statement.

The course design builds computer conferencing into the study of the course and its assessment. The success of these activities is not dependent on the tutor, because the online activity guide clearly sets out what to do at each stage. Tutors are there as a back-up if needed. Students have to participate – if they wish to score good marks on their assignment – but the process involves them in valuable learning which is core to the learning outcomes of the course.

Five tutors participated in telephone interviews that lasted over an hour. All felt that the activities were highly successful and that students were actively conferencing right from the beginning of the course as a result. This course was more successful in this regard than other OU courses that they had tutored. Tutors highlighted the centrality of the Web to content and process. The aim of the course '*… is to provide you with the* skills *needed to develop your own environmental literacy and to take part in informed environmental debate and action, rather than to expand your environmental knowledge as such. …'(Course Chair Introduction & Guide)*

Three students were interviewed about the first conferencing activity and all three felt able to contribute and even to disagree with other students in their group, none of whom they had met at that point. One student revealed the way in which identification with the needs of her island enabled her to argue for her views without worrying about offending others in her group – students were discussing not for their own personal positions, but in relation to an island whose needs they had developed some understanding of:

‘About half way through we put everything on a spread sheet to see what kind of opinions were coming forward, and it was quite clear that three issues were coming forward from most people, …if you weren’t in that consensus you would be in a minority and probably you’d have more sway if you felt able to join the majority…on most of the issues I could but there was one or two issues where I said no there’s no way I’m going to compromise on that…I was Haiti, so I was very poor…there was a lot of wealthy islands, so some didn’t have the issues that Haiti did so there was some things that I just couldn’t compromise on.’ (student interview)

Some aspects of the conferencing strategy for the course do not suit some students, in that they introduce more deadlines and force students to contribute to their group at particular times. However there is also a national conference not tied in to the assignments and tutors felt that the conferencing as a whole provides better support than on courses where there are face to face tutorials but no conferences. One tutor commented*:*

‘… I think from the support point of view I think it’s unparalleled…I spend more time with my online students than I do with my conventional students…I think we do get a very cohesive tutor group feeling …three quarters of the people use the national conference…It’s a very very well-used conference.’ (Tutor interview)

The quality of online student support is one element in the high retention rate of the course. 77.6% of students who started the course passed it in 2005, by comparison with the average of 66.5% for all level 3 courses in the Science Faculty. Although some students do experience this course as less flexible than courses not so online, the high pass rate is an indication that any negative effects are ameliorated by the quality of the activities, student enjoyment of the course and their supportive experience on the conferences (Thorpe and Godwin, 2006).

4.1 Case Study 2: Online tutorials for all students, timed for the start of topic study

Case Study 2 is a 600 hour course within the BSc Hons Physical Science degree which recruits c420 students each year. The course team offers students both a national conference for general queries and comments, and a regular etutorial on a different topic per tutorial. One tutor is assigned the role of moderator for a particular etutorial and nineteen etutorials are run at approximately two weekly intervals. The etutorials typically start on a Saturday of the week in which the students are supposed to study that topic and they are at their most active in the first few days, typically therefore over the weekend, though they do stay open during the week and contributions can still be made.

One of the researchers studied and passed this course as a student, and notes his own reaction to the etutorial strategy: 'The conference topics seemed to come up before I had actually read and done the corresponding exercises/activities. This was partially because the conferences came up at the beginning of the week and related to the activities of that week – so in a sense you have to be a week ahead to fully exploit them. Of course if you are a little behind, say by a week, you will not feel that you can actively participate.' (researcher comment) This element in the design of the conferencing therefore cuts across the study approach of studying material first, before discussing it, and was particularly difficult for students who were somewhat behind the study schedule, which is often the case. The etutorial strategy assumed that students would be interested in discussion in advance of or alongside studying the topic. There were other features that students also found difficult.

The etutorials were open to all students, with a different tutor assigned to moderate each one. With over 400 students registered therefore, a large number of messages could be the result. This happened with the first tutorial, with over 400 messages, but thereafter only a few topics brought more than a hundred messages and the rest were around 50 messages or fewer. This drop in contributions was partly the result of students being put off by the overwhelming number of messages for the first etutorial, and also by the lack of active moderation by tutors. Students were aware that an opinion or comment might not be correct but they might have to read through many such contributions before finding the tutor correction. Seven students were interviewed and one student who liked the general conference pinpointed the problem with the e-tutorials:*'...If it was a face to face tutorial any problems encountered…would have been ironed out very quickly but not on an etutorial. Not only are they not ironed out you have to go through many pages of possibly incorrect material before you get to a satisfactory answer that the tutor has added to or thrown in at some point..a question might be asked and there might be 20 or 30 pages of incorrect information which you read which I think is nonsensical.'(*student interview)

Other students also found that the only way of using the etutorial successfully just did not fit with their usual study patterns: *'Whilst they are available, I found that to keep a grasp of the thread you need to 1. study online all weekend 2) do nothing and review the entire conference afterwards. I have not the time to stay online all weekend and once back at work on Monday cannot afford the time to comprehend all threads.*'(student interview)

Another student commented '*conferences(etutorials) should be open for weeks not weekends.*' Thus out of 72 student comments to the questionnaire, all except 17 were either negative or reporting non-participation. The 17 positive comments however did identify benefits from learning together, such as '*sharing information and thought-provoking questions with others is invaluable, allows you to be part of*

a 'class'.' *'Reassurance that I'm on the right track. Ability to read conferences, even when unable to take part live*.' One of the student interviewees who had valued the etutorials, also highlighted the way some tutors could improve their learning value:'*I thought they (etutorials) were very good. I mean some tutors were better than others. The ones that I liked the best…summarised, they did different aspects of their subjects and they summarised each one'*. (student interview) This underlines that the strategy used for conferencing here, relied upon tutors carrying out moderation of online interaction effectively. Some were clearly better than others at doing this, whereas the design of the conferencing in case study 1 structured students' interaction and did not depend on the moderation expertise of tutors.

Overall, the design of the interpersonal interaction enabled only a small proportion of students, apparently those who were ahead of the study timetable, to benefit from participation. Even reading could prove unsatisfactory given the high proportion of time required for uncertain benefit. The model was to do online what might be done in a face to face tutorial – literally to open up a topic and let anybody comment. This process was vulnerable to the disadvantages of large numbers of messages not well threaded and in some cases, lacking effective moderation or summary.

5.1 Case Study 3: Tutor-group discussion, marks allocated in two assignments

Case Study 3 is a 600 hour course recruiting c320 students, who take it as a core course within the BA Hons. Business Studies. One of its six learning objectives is 'collaborating with others and working in a team to achieve a common goal.' 30% of the marks for the third assignment are allocated for reflection on group discussion, though this could be in a face to face tutorial or the online conferences. For the final assignment, students work together in a group to research a topic, and 10% of the marks are for reflecting on the experience of working in a collaborative research group.

The Course Guide stresses the benefits of CMC for academic discussion and working together. However, during the group activity at the end of the course, students are invited to discuss and to compare viewpoints using the conference on only three occasions. There are no structured activities to scaffold this interaction and students could feel pressured to take part purely for reasons of completing assessment: One of six students interviewed commented:'*I wouldn't say we are encouraged to interact, more we are forced by the TMA*s.' (student interview)

Furthermore, other elements in the course emphasise the goal of independence in learning, and by the time of the research group activity at the end of the course, students have not had any significant experience of working together online. One student compared this with her experience on other courses: '*On previous courses (two Technology courses named) there seemed to be a good online support network and rapport, where tutors and block consultants…all conferenced like crazy to*

create a happy and slightly mad area where the shyer ones (me!) felt comfortable to join in the banter…(this course) is not like that at all.' (student interview)

It had not proved possible for this student to make use of her prior good experience because the course did not create an appropriate context within which this could happen. Tutor responsiveness was one of the key factors in that context creation: 'The national… conference is slightly more active and I find the tutors there a bit more encouraging online. They respond to postings, make insightful comments and ask leading questions... I would post there rather than my tutor group if I wanted clarity on a particular course issue.' (student interview)

6.1 Discussion

Three courses were the subject of qualitative research as case studies of high levels of interpersonal interaction, strongly integrated into the course design. We might have expected therefore that student experience would have been more similar than it was. One of the courses generated high levels of participation while the other two did not, though for different reasons and in different ways. Case study 2 did not engender widespread use of the etutorials, whether by readers or contributors, inspite of the tight link between course content and tutorial content. The timing and the lack of structure of the etutorials put off most students who tried the first one, and study pressures thereafter effectively meant that they made little or no use of them.

Case Study 3 integrated tutor group conferences through marks in two assignments but there were not enough activities requiring conferencing during course study and no detailed guidance or structure for the process of interacting online. Enthusiastic and skilled tutors could make a difference, if they provided good summaries, or were responsive. However, students could simply avoid participating in the computer conferencing and still do well in assignments. Case Study 1 however created a well-structured conferencing environment, where the content of what students had to do was central to the course learning outcomes. Highly structured activities online feeding into conferencing were key to getting all students participating from the beginning of the course. Marks were awarded for participation but the process also proved intrinsically valuable to the core learning objectives of the course. The course team made no compromises on the idea of the Web as a space for discussion and debate as well as information gathering.

The issue arises of how we respond to findings such as these. Do they suggest that conferencing cannot support group discussion, is less effective than face to face tutorials, cannot provide study support for students studying off campus, and so on? We do not think this is an appropriate conclusion. Although we have two cases where conferencing was not very successful, we can now see the reasons why this was so. And there is also the positive evidence of case study 1, where there was much more success in achieving some of the claims for computer conferencing.

We need to move away from seeing a direct relationship between particular technologies and explicit learning experiences and outcomes. Computer conferencing can bring great learning opportunities and it can also be a non-event or even frustrate and undermine learning. It is in the detail of the practices through which students encounter it that we find the drivers for how it will impact on their activity and learning. Brown, Collins and Duguid's account of situated cognition reminds us how important the practices are through which we teach and support learning. Context and practice are at least as important as the technologies in use. We may use one term for a technology such as computer conferencing, but in practice, there are multiple instantiations of that technology in use, generated by the different designs and purposes to which it can be assigned.

Researchers therefore need to clarify the practices as well as the technologies in use so that it is clear what model of technology use their findings relate to. This will help avoid misleading practitioners either in the direction of false positive expectations or equally false negatives. Wu and Hiltz (2004) for example, report research outcomes claiming that computer conferencing facilitates higher-order thinking skills, high levels of cognitive engagement, critical thinking and so on. These categorical statements however do not readily translate into teaching strategies. Many teachers seeking to develop such outcomes in their students by using computer conferencing may discover that it fails to deliver them or does so only for a very small number of students. This is because the key is not purely in the potential or affordance of the technology, but in that plus the activities that are designed to enable its use. Researchers need to go further in helping make research more useful by explaining in some detail what form the conferencing takes, through what activities it is delivered, according to what timetable and assessment regime. It is these features of practice in context, many of which can only be put in place by the teacher him or herself, through which the apparent benefits of a particular technology can be realised.

Narrative accounts of learning design benefit from diagrammatic representations that enable a practitioner to capture the key elements in their own teaching. We need to use a notational form that can 'serve as a model or template adaptable by a teacher to suit his/her context'.(Agostinho, 2006, p3). The OU UK is also developing a project using a software notation tool that can incorporate both visual and explanatory details of learning designs. The design of the first online collaborative activity in case study 1 has been captured using this software and figure 1 shows how students prepare for and then engage in the online collaboration.

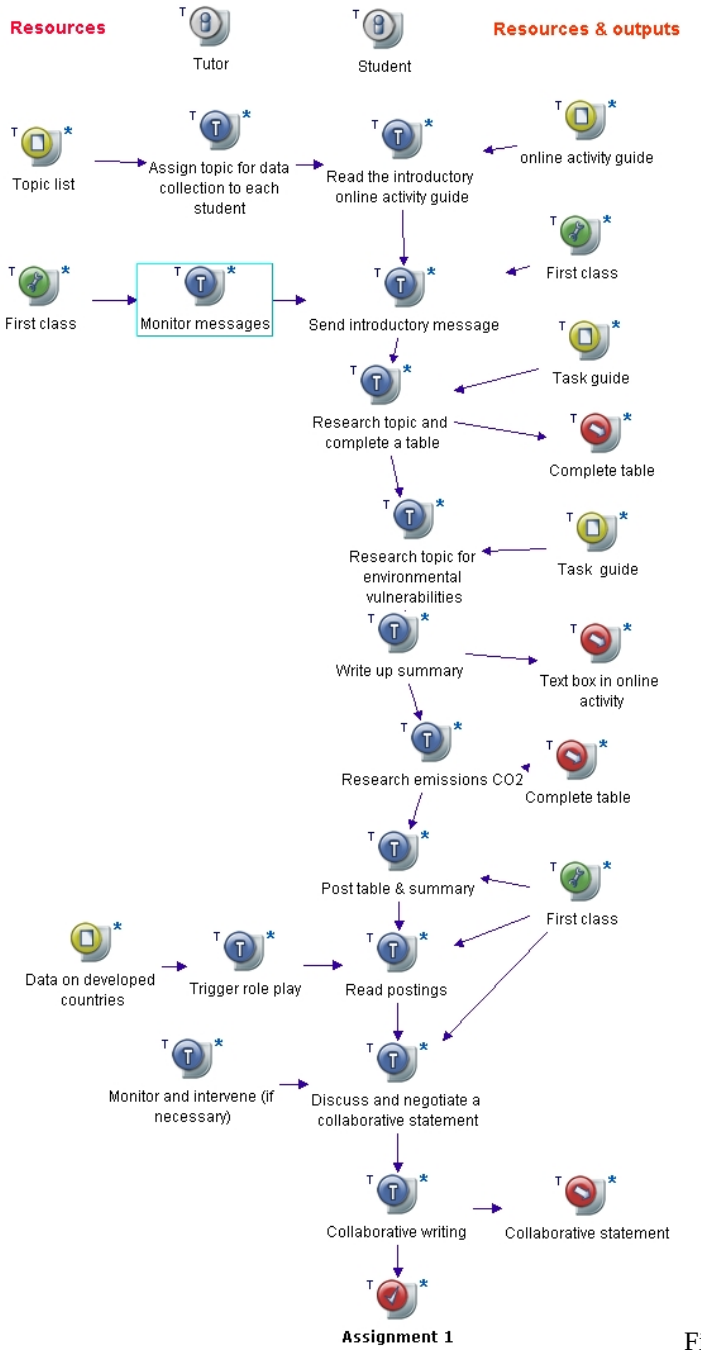
Resources
Tutor
Student
Resources & outputs
Topic list
Assign topic for data collection to each student
Read the introductory online activity guide
online activity guide
First class
Monitor messages
Send introductory message
First class
Task guide
Research topic and complete a table
Complete table
Research topic for environmental vulnerabilities
Task guide
Write up summary
Text box in online activity
Research emissions CO2
Complete table
Post table & summary
First class
Data on developed countries
Trigger role play
Read postings
Monitor and intervene (if necessary)
Discuss and negotiate a collaborative statement
Collaborative writing
Collaborative statement
Assignment 1

Figure 1:

The learning design for the computer conferencing activity in Case Study 1

The notation used in figure 1 places student tasks at the centre of the design in the middle column, with arrows out to the resources and tutor tasks that they require. Outputs from activities, such as completing a data table, are also shown. Detailed explanations of each symbol are visible in the online version, by clicking on the icon and revealing the relevant explanation. It is intended that representations of learning designs such as these can be used to document how student activities are designed, so that teachers can see whether similar approaches could be used or adapted for their own courses. Where practice is evaluated or researched, it could also be used to document the design of the practice to which the findings relate, so that teachers can put research findings into context and make better judgements about whether similar results could be achieved in their own context.

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