Learning to ‘chat’ in a virtual learning environment: Using online synchronous discussion to conduct a first year undergraduate tutorial

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ABSTRACT

Previous research has confirmed that most university tutors are using virtual learning environments (VLE’s) to simply distribute course materials rather than to build on the learning generated in face to face interactions. Unless VLE’s are actually used to enhance the learning of the student over traditional face to face interactions, they remain merely a virtual environment. The purpose of this pilot study was to implement and critically assess the use of online synchronous discussion (OSD) to conduct an online tutorial through a university VLE. The aim was to identify if these online communication tools can be used in a way that actually enhances student learning. The effectiveness of the online tutorial was measured using student questionnaire (n=91), focus group and analysis of the tutorial discussion transcript. Students found the conversational style of OSD very useful for getting queries answered quickly and effectively and the multimedia functions useful for keeping a record of the discussion and for scaffolding their understanding. The OSD was also an effective medium of communication for students who would normally be unlikely to contribute to face to face discussions. However, the study concluded that one or a combination of the following aspects limited the effectiveness of the OSD: the large size of the group; the one-off nature of the tutorial; its similarity to other social communication applications; and the characteristics of the OSD software tools. The study’s recommendations build on previous models of teaching and learning with technology and stress the use of constructivist and ‘communal constructivist’ principles to deliver future OSD. The importance of establishing a pedagogical framework is discussed when teaching with new technologies.

Key words: Synchronous discussion, computer mediated communication, constructivism, student perception, teaching with technology

Abbreviations of Key Organisations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>BECTA</td>
<td>British Educational Communications and Technology Agency</td>
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<td>HEFCE</td>
<td>Higher Education Funding Council for England</td>
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<td>JISC</td>
<td>Joint Information Systems Committee</td>
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<td>Naace</td>
<td>National Association of Advisors for Computers in Education</td>
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<td>QCA</td>
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<td>UCAS</td>
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INTRODUCTION

The challenge of creating a student-centred curriculum for the increasing number and diversity of students now entering higher education (UCAS, 2007) has led to an expansion in the use of technology to support learning (BECTA, 2003a). Commonly termed ‘e-learning’ and ‘technology enhanced learning’, the use of ICT (Information and Communication Technology) in learning, teaching and assessment is now an expectation of all Higher Education Institutions (HEI’s) (HEFCE, 2005) and students (JISC, 2006a). One of the most effective technological innovations to support learning in Higher Education (HE) is the Virtual Learning Environment (VLE) – a collection of integrated online tools that enable the management of learning, providing a mechanism for content delivery, assessment, resource sharing and communication (JISC, 2006a).

Although VLE usage in HE is growing, it is agreed that their effectiveness is being limited by a lack of tutor innovation in moving beyond the basic features, and at least until recently, a lack of independent and reliable research evidence (BECTA, 2003a; JISC, 2006a). Whitworth (2005) has also argued that the pace of technological change has left less time for evaluation and reflection. In the current study, the Teacher-Researcher (TR) will aim to develop these limitations by piloting and critically evaluating the use of computer mediated communication (CMC) to deliver a student tutorial. The use of ‘online synchronous discussion’ (OSD; conducted in ‘real time’ but from different locations) via a university VLE will form the basis of the study. OSD (also known as ‘online chat’) has been shown to improve both interaction and collaboration between students, acting as an effective scaffold to their learning (Wang, 2005; Holmes & Gardner, 2006).

BECTA (2004) have urged practitioners to develop further research in the use of communication within VLE’s. In addition, Chen, Ko, Kinshuk & Lin (2005) and Linder & Rochon (2003) have recently called for greater research into the use of OSD tools. One of the key reasons for conducting the study is because a single mode of delivery will not provide students with the choices, engagement, social contact and relevance needed to facilitate successful learning (Singh, 2003).

E-learning and Technology-Enhanced Learning

Although a wide range of definitions of e-learning have been proposed over a period of several decades, each one usually reflects the relationship between pedagogy and technology. However, the most simplistic (and far too common) definitions such as ‘Online access to learning resources, anywhere and anytime’ (Holmes & Gardner, 2006, p.14) do not reflect how the access to technology will improve the quality of the learning process. Consequently, the following definition is preferred: ‘E-learning is learning that is enhanced through the effective use of new technologies’ (Naace & QCA, 2007, p.7, emphasis added). More recently, the term ‘Technology enhanced learning’ (TEL) has also become common (Lytras, Gasevic, De Pablos & Huang, 2008). This phrase importantly indicates the role of technology – to actually enhance learning!
Virtual (Learning) Environments

The position of the TR is that the effective use of a VLE can fulfil the definition of e-learning (and TEL) identified above. However, in line with Simpson (2001) the TR also argues that unless the virtual learning environment is used to enhance the learning of the student over traditional face to face interactions, it just becomes another virtual environment. The challenge for practitioners delivering campus-based courses therefore, is to utilise the right VLE tools at the right time in a way that empowers, challenges and extends students beyond their face to face learning experience (Wang, 2005).

Although developments in VLE’s have been substantial, BECTA (2003a) suggest many of the early innovations focused on the technology rather than the pedagogy. Britain & Liber (2004) have also confirmed that most university tutors are using VLE’s to simply distribute class information (e-administration) or course materials (e-content management) rather than to build on the face to face interactions (e-learning).

The VLE offers a number of general benefits that can enhance f2f delivery, over and above providing an electronic copy of resources for student access. These include signposting further learning opportunities and saving time for both student and tutor (JISC, 2006a) as well as increasing communication channels (BECTA, 2004). However, other key benefits include improved student motivation and engagement (Watts & Lloyd, 2000; Wilson & Whitelock, 1997) as well as the flexibility of ‘anytime, anywhere’ access (Jacobson & Kremer, 2000). Research has also found students developing higher level learning styles (Gibbs, 1999) and increased gains in ICT capability and presentation skills (Watts & Lloyd, 2000). Studies have found an increase in self-directed study by students (Russell, 2000) and greater contribution by normally passive students (Tanner & Jones, 2000). Participation and performance was also increased with the use of online seminars in a study by Pilkington, Bennett & Vaughan (2000).

Unfortunately, VLE’s are not without their limitations. Taylor (2001) has highlighted the need for significant investment in staff training as well as the time-consuming nature of developing courses. BECTA (2003a) also warn of the temptation to assume that all students are motivated by e-learning, and whether less able students will have the concentration and discipline that computer-based learning requires. Despite the identified limitations, it seems that there are real possibilities for enhancing teaching and learning using VLE’s through greater use of their communicative and interactive features. One such function of a VLE, found to enhance the learning of students, is the ‘computer mediated communication’ tool.

‘Computer Mediated Communication’ and ‘Online Synchronous Discussion’

For the purpose of this study, CMC is characterised as text based interaction conducted through a technological medium. Although this definition does not encompass the whole potential of CMC, it does suit the needs of this study as the communication medium used to conduct the online tutorial will be text. It is generally agreed that there are two forms of CMC – asynchronous and synchronous. Online asynchronous discussion (OAD) most commonly provides
‘any-time, any-place’ collaboration providing freedom of time (so learners participate when and if they choose), opportunities to backup assertions, more time for reflection, [and] more time to phrase the intervention (Marjanovic, 1999, p.131).

Alternatively, synchronous discussion provides

‘same-time, same-place’ or ‘same-time, any place’ collaboration providing immediacy, faster planning, problem solving, scheduling and decision making processes (Marjanovic, 1999, p.131).

JISC (2006c) have identified many advantages of using CMC. It has been found to make the process of learning more visible to both students and tutors, as well as providing an archive of the discussion that can be revisited individually or as a group. Providing a written account also ensures that all students receive the same information or guidance aiding parity and saving tutor time in repeating instructions or suggestions (JISC, 2006c). The nature of online discussion, with the lack of visual cues, also provides participants with a more equal footing to air their views and contribute to the debate.

Some researchers (Green, 1998; Im & Lee, 2004) claim that asynchronous discussion (such as email, discussion boards and wiki’s) provides substantial learning opportunities because learners have time for reflection and composing more detailed messages. Ironically however, Pilkington (2004) suggests that the flexibility of access and time found in OAD may become a weakness if one is trying to move a discussion forward, gain spontaneous feedback and reach a consensus. For this reason ‘live’ or ‘real time’ discussion using OSD tools such as chat or instant messaging (IM) provide great opportunities for those wanting more conversational-style activities, as in traditional f2f tutorials. Therefore, OSD’s similarities to classroom interactions provide it with benefits that asynchronous discussion would have difficulty in achieving (Chen et al, 2005).

The essence of these benefits can be appreciated more readily if the different functions available in OSD are identified. MacDonald (2006) suggests that common synchronous functions can include audio, text chat, whiteboard, break out rooms, application and desktop sharing, web browsing, video functionality as well as options for polls, feedback and virtual ‘hand-raising’.

Advantages (and perceived advantages) of OSD

Hannum (2001) has suggested that the advantages of OSD over f2f approaches can be grouped into three categories: logistical, instructional and economical. The greatest logistical advantage of OSD is its flexible, distributed delivery that allows tutors and students to participate from any geographical location at any time (Hannum, 2001). The key economical advantage is that OSD can eliminate the costs related to travel and time away from home (Hannum, 2001). The most distinctive instructional advantage is the ability of the learners to interact with the tutor and each other using a variety of rich multimedia resources that could effectively ‘scaffold’ learning (Walker, 2004). This could even involve learners discussing multiple topics simultaneously (with the use of ‘break out’ rooms) without interrupting the flow of
other participants who have moved their discussion in other directions. These instructional advantages view the use of OSD as a powerful constructivist learning tool because of its ability to support interaction and collaboration (Wang, 2005; Holmes & Gardner, 2006) (see the following section on ‘Learning and Teaching with Technology’ for a discussion of the key pedagogical frameworks).

Further research using OSD highlights the importance of immediate feedback and increased levels of student interaction, involvement and motivation (Chen et al., 2005). OSD provides access to immediate information and feedback so that students can strengthen their understanding and/or correct any misconceptions. This is particularly essential for the kind of answers and information that students require in a tutorial (Chen et al., 2005). The increased interaction and involvement, and frequently the novel nature of OSD to new students, provides a further level of engagement with the material being discussed – potentially enhancing the learning process further. As Wang (2005, p.304) has suggested OSD can engender a sense of involvement in the communication process through quick feedback, support and decision making.

The role of motivation and interaction identified above are given greater weight when Yacci (2000) claims that ‘instructional interactivity’ has both content learning and affective benefits. Contreras-Castillo, Perez-Fragoso & Favela (2006) claim that affective benefits are as important as the learning of content in any formal education course. Furthermore, given the enjoyment and feelings of intimacy that young people have found in tools such as instant messaging (Hu, Fowler Wood, Smith & Westbrook, 2004) this environment could provide many opportunities for learning beyond those of f2f interactions. Even though researchers have found much of the discussion in OSD to be ‘off task’ (Contreras-Castillo et al., 2006; Kirkpatrick, 2005; Williams, 2002) Wenger (1998) contends that this is an important part in the development of a ‘community of practice’ that will eventually lead to greater gains in student learning.

BECTA (2003a) and Zhang, Perris & Yeung (2005) are keen to highlight that the use of electronic tutorials may be advantageous for students who are reluctant to get involved in class discussions. These studies identify real advantages for students who do not feel comfortable in voicing their opinions f2f, or asking questions in front of their peers. Zhang et al (2005) also acknowledge that research into online discussion has enhanced communication between students in situations where tutorial attendance was low.

Finally, much research has been conducted into the performance benefits of OSD. Unfortunately, Burnett (2003) claims that many of the small-scale studies using online chat reveal disappointing results. Despite this, recent evidence has suggested that those students who ‘lurk’ in educational OSD (by logging on but contributing little to the discussion) have performed as well as those contributing most to the activity when it comes to final assessment (Taylor, 2002). This suggests that OSD is beneficial for all students who attend online tutorials. This is a useful finding, particularly given that ‘examination marks improve significantly with increased tutorial attendance’ (Sharma, Mendez & O’Byrne, 2005, p.1375).
Disadvantages (and perceived disadvantages) of OSD

In her extensive research into online chat, Burnett (2003) suggests that there are several features which distinguish (and disadvantage) online discussion from f2f discussion. By their nature, contributions in OSD are limited to one or two lines in length – any longer and participants find that the conversation has moved on or a question has been answered by another learner. This makes reflection, articulation and deep learning harder in this fast moving environment (Zhang et al., 2005). The lack of paralinguistic cues, such as body language, gesture and eye contact also make it hard for participants to judge respondent’s intentions or levels of confidence. Finally, Burnett (2003) suggests that the simultaneous posting of responses can lead to much confusion and a lack of focus – frequently termed ‘topic decay’ (Herring, 1999) or ‘conversational chaos’ (Wang, 2005). This problem is further exacerbated when tutors try to undertake OSD with large groups of students (Contreras-Castillo et al., 2006).

Research has also pointed to the need to download additional software to student’s own computers in order to use the more advanced chat tools such as audio or video (Contreras-Castillo et al., 2006). Students have experienced difficulties getting online or failing to have the minimum specification of computer required to run programmes satisfactorily (Chen et al, 2005). Some applications are also complicated to navigate, leaving students annoyed and turned off from future online opportunities (Chen et al, 2005). These perceptions are an important factor for the tutor to consider, particularly when the characteristics of the tools used with the learning environment are the best predictor of student satisfaction (Gunawardena & Duphorne, 2000). Dissatisfaction in this area may be a contributor to the findings of Zhang et al (2005) who claim that the majority of students prefer f2f interactions.

Much research has also concluded that OSD is a more suitable tool for the development of social cohesion than for learning (Cox, Carr & Hall, 2004; Im & Lee, 2004). Students in these studies found it more useful in generating informal discussion with peers and for co-ordinating activities between classes. In a recent study of level 3 undergraduates, the majority of students also concluded that the use of a ‘virtual classroom’ was ‘too playful to be real learning’ (Kirkpatrick, 2005, p.158). Given the increased use of IM, text messaging and chat rooms for socialising amongst young people (Hu et al, 2004; Grinter & Palen, 2002, in Contreras-Castillo et al, 2006) it seems only natural for students to see the use of similar tools as anything but ‘playful’. The lack of evidence identifying how to structure OSD for optimal learning (Wang, 2005) does not help those who have seen (albeit in limited ways) the potential of using online discussion to enhance their students’ learning. Thus, there is a vital and practical need to develop pedagogical strategies in order to create effective OSD. The following section will explore these issues.

Learning and Teaching with Technology: From theory to practice

Recent developments in e-learning have emphasised socio-constructivist models of learning (Walker, 2004; Zhang et al, 2005). These studies base their approach to learning on the work of Dewey (1901) and Vygotsky (1978) who have long argued that learning occurs in a social context. Socio-constructivist theory suggests that the social environment in which learning takes place enables more knowledgeable others to ‘scaffold’ (Wood, Bruner & Ross, 1976) learning to a higher level than would be
possible than if learning was conducted individually. Recently however, research has identified the term ‘communal constructivism’ – a term which suggests that e-learning can stretch or extend the socio-constructivism paradigm (Holmes, Tangney, FitzGibbon, Savage & Meehan, 2001; Holmes & Gardner, 2006).

Communal constructivism is an approach to learning in which students construct their own knowledge as a result of their experiences and interactions with others, and are afforded the opportunity to contribute this knowledge to a communal knowledge base for the benefit of existing and new learners (Holmes & Gardner, 2006, p.86).

In communal constructivism, each member of the community sets out to enhance their own learning and the learning of others with equal emphasis – An approach requiring a large culture shift in both tutor and student mindsets. The use of technology in learning magnifies the opportunities for communal learning by providing a medium to store and make available the knowledge created by the community (Holmes & Gardner, 2006) as in an archive or transcript of an online discussion.

Two models of learning that have been developed specifically for learning and teaching with technology both have theories of socio-constructivism at their heart. Mayes’ ‘Conceptualisation Cycle’ (Mayes & Fowler, 1999) and Salmon’s ‘Five Stage Model’ (2004) identify the importance of communication between learners and tutor as a central feature in learning. Mayes & Fowler (1999) argue that learners must be supported at three levels of the conceptualisation cycle, and that each stage is achieved through different kinds of courseware. The conceptualisation stage, where learners are exposed to others’ ideas or concepts, usually through the presentation of ideas (primary courseware); the construction stage, where participants are required to apply the newly learnt concepts in meaningful ways through computer-based tasks (secondary courseware); and finally the dialogue stage, where application of the concepts are tested via conversation with others, such as in CMC (tertiary courseware). The opportunities afforded in a VLE and via CMC in particular could provide the required support at each of the three levels to enhance student learning.

Salmon’s (2004) highly practical ‘Five Stage Model’ focuses specifically on CMC. There are some synergies (although Salmon focuses all five stages on CMC) between Mayes’ stages one to three and Salmon’s stages three to five. Essential for stage one is the ability of participants to access and use CMC. Stage two involves individual participants establishing their online identities and then finding others with whom to interact. At stage three, participants give relevant information to each other. Up to and including stage three, a form of co-operation occurs, i.e. support for each person’s goals. At stage four, deeper group discussions occur and the interaction becomes more collaborative. At stage five, participants look for more benefits from the system to help them achieve personal goals, explore how to integrate CMC into other forms of learning and reflect on the learning processes. It is in the final stage that we see the greatest links with constructivist approaches, but as JISC (2006a) have identified, this will require the tutor to help students to build the necessary skills to interact in such a way online. Both of the models identified above have great potential for tutors considering how to structure OSD with their students.
As already suggested, previous studies into the use of CMC have utilised theories of socio-constructivism to enhance the student learning experience. In addition to the two models proposed by Mayes & Fowler (1999) and Salmon (2004), these studies provide invaluable information to prospective tutors of online communication. In particular, Walker (2004) has identified the use of socratic and devil’s advocacy strategies to enhance student’s debating and reasoning skills, which had the effect of producing ‘constructive conflict’, leading to the ‘scaffolding of mature writing behaviours’ (p.172). Similarly, research has shown the importance of the tutor questioning style during OSD, highlighting that open-ended questions promoted discussion and elicited a wide range of responses (Wang, 2005). Finally, research (Lim & Cheah, 2003) has identified the importance of the quality of resources used in CMC, as these are frequently used to scaffold learning, both before (to develop background knowledge) and after the session (for further exploration). These studies begin to provide a number of recommendations that will enable the novice tutor of CMC to create a purposeful learning environment.

The extensive review of literature has provided a sound foundation for the use of CMC with students. However, as Chen et al (2005) have argued, because there are few published strategies on how to deliver and structure effective OSD, the tutor must utilise their knowledge of technology and of pedagogy. Having said that, models are beginning to emerge which may support the online tutor, such as those provided by Lim & Cheah (2003) as well as recent studies which have utilised the work of Mason (1991). To the TR’s knowledge these two studies have not previously been compared. Lim & Cheah (2003) suggest 6 roles of the online tutor, and whilst being focused on asynchronous discussion, encourage educators to trial their recommendations in synchronous environments. Mason (1991) has suggested just three key responsibilities of the online tutor, although following comparison it appears that Lim & Cheah’s (2003) six roles fit succinctly into the three overarching responsibilities. These complementary relationships can be seen in Figure 1, adapted from both Mason’s (1991) and Lim & Cheah’s (2003) recommendations. They will provide the online tutor with further guidance on their roles when facilitating OSD – namely in the areas of social, organisational and intellectual support.

**Figure 1: Responsibilities of the Online Tutor**

<table>
<thead>
<tr>
<th>Mason’s three responsibilities for the online tutor</th>
<th>ORGANISATIONAL</th>
<th>INTELLECTUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SOCIAL</strong> Effective open discussion requires a safe, supportive environment.</td>
<td>Ensures students can access discussions and manage dialogue.</td>
<td>Providing meaningful learning opportunities for students.</td>
</tr>
<tr>
<td>Lim &amp; Cheah’s six important roles of the tutor in asynchronous discussion boards</td>
<td>Setting meaningful tasks.</td>
<td>Answering queries, providing feedback and posing conflicting views to elicit thinking/reflection.</td>
</tr>
<tr>
<td>Keeping the discussion focused.</td>
<td>Guiding participants in the ‘technicality’ of online discussion.</td>
<td>Drawing conclusions and providing content expertise.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recommending resources for extension of learning.</td>
</tr>
</tbody>
</table>
Unlike the majority of research on OSD, this study will focus on the perceptions of the participating students on the use of the ‘online tutorial’. In summarising this study, it is also the intention to make comparisons between online and face to face tutorials. The study aims to answer three key questions:

1. What are the potential benefits and limitations of using online synchronous discussion with undergraduate students?

2. What are undergraduate students’ perceptions of the use of an ‘online tutorial’ versus the more traditional ‘face to face tutorial’?

3. What recommendations can be drawn for educators delivering online synchronous discussion/online tutorials with undergraduate students?

**METHOD**

**Participants**

The cohort of Year 1 students (n = 91) enrolled on a BA (Hons) degree in Sport & Physical Education at the TR’s university were asked to participate in a ‘virtual tutorial’ as part of their normal studies. In order to integrate the use of OSD into the unit, it was decided to schedule the online tutorial in the place of one of the one-hour lectures in week 18 of the course. This was 5 weeks before the submission of a written assignment by the participants. The students were very familiar with using the virtual learning environment, but it was the first time that they had used the ‘Live Classroom’ software. The Year 1 sample was selected as these were less likely to have had any prior experience of OSD in an educational setting (preventing contamination of data) and because assessments in Year 1 do not contribute to degree classification, allowing fewer risks to students.

**Resources**

The online tutorial was piloted with the ‘Live Classroom’ application, provided by a commercial company, Horizon Wimba (http://www.wimba.com). This tool has since been adopted by the university as their main instrument for OSD, since it offers perceived advantages over Blackboard’s own ‘Virtual Classroom’ (see http://blackboard.com). Conducting the OSD within Blackboard gave students a common interface, and a feeling of familiarity leading into the ‘Live Classroom’ and meant that they could access the tool via a hyperlink, which would open up the chat application in a new window. Conducting OSD through Blackboard also guaranteed that student attendance was logged via the tracking tools and ensured that once students had closed the chat window, they had immediate access to the online survey that was to be completed through the VLE.

Chen et al (2005) suggest that because of its lower bandwidth requirements, text is more accessible than audio, and audio is more accessible than video in OSD. For this reason, the ‘text’ function of ‘Live Classroom’ was used (rather than audio/video), so that as few students as possible were disadvantaged because of their available hardware specification. In addition to the ‘text’ function, the tutor also allowed use of
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the interactive whiteboard so that Powerpoint slides could be shown to students (within the same screen) during the online discussion (see Figure 2).

**Figure 2: Screen shot of the ‘Live Classroom’ window**

![Screen shot of the ‘Live Classroom’ window](image)

**Instruments**

**Questionnaire:** An online questionnaire specifically designed to evaluate students’ perceptions of the ‘online tutorial’ received 69 responses (64 complete responses) the same number of students that were recorded within the OSD via the VLE tracking tools (100% questionnaire completion by those who participated in the OSD). 69 out of a total of 91 (76%) participants were recorded as participating in the OSD, although it was discovered that some students contributed to the tutorial in pairs or small groups from one computer. Questions relating to the following areas were created: effectiveness of the online tutorial in preparing to write the assignment; perceptions of the usefulness of the online tutorial versus f2f tutorials; overall effectiveness of the online tutorial; geographical location of student during OSD. The questionnaire utilised similar questions and format to a number of recent CMC studies (Chen *et al.*, 2005; Sweeney, O’Donoghue & Whitehead, 2004; Zhang *et al.*, 2005) as well as other topics identified by the TR. Whilst a questionnaire could be criticised for yielding only superficial information, in this study, it was seen as being an efficient use of time to gather otherwise unknown information on the use of OSD. Tricker, Rancroft & Long (2005) also remind us that questionnaires that seek student opinion or evaluation tend to invite criticism. Whilst this is important to consider, the student questionnaire will at least be used in conjunction with a semi-structured focus group, providing opportunities to discuss particular ‘criticisms’ should they occur.

All 14 questions bar one required a multiple-choice response from students. This generally took the form of a five-point likert-scale but also included questions where students had to choose their preference for a given question. The final question provided students with the opportunity to give their name so that they could be contacted for a follow up semi-structured focus group. The survey was piloted on four first-year students who study on a different degree. Feedback from the pilot was used to modify the questionnaire before its use in the study.
**Semi-structured focus group:** One week following the online tutorial, a small group of students (n=6) were invited to participate in a short (20 minute) semi-structured focus group that would add a considerable amount of qualitative data to that obtained by questionnaire. It was felt that informal, f2f discussion with a small group of participants would add ‘authenticity, richness, depth of response, honesty and candour’ (Cohen et al, 2000, p.255). Questions for the focus group were devised in conjunction with the online questionnaire to ensure parity and to allow opportunities for richer data. Following analysis of the questionnaire the focus group questions were revisited by the TR and one question added to allow investigation into student’s contributions in the OSD. Verbal agreement was made with all focus group participants to audio-record the session, which enabled more comprehensive data to be gathered for analysis.

**Transcript of OSD:** Elsewhere, research has identified the use of content analysis to explore the CMC dialogue, coding participant contributions by meaning or context (Burnett, 2003; Contreras-Castillo et al, 2006; Kirkpatrick, 2005). Whilst these forms of data collection have proved successful, detailed analysis in this form would not provide information that would support the TR in answering the three key questions in this study. For this reason, only qualitative data will be gathered from the OSD transcript. However, detailed quantitative analysis of the CMC dialogue in future research is not discounted.

**Procedures**

Kirkpatrick (2005) suggests maintaining a structure in OSD that resembles other f2f classes. Although Marjanovic (1999) suggests that adopting old teaching methods with new technologies will not be the most productive outcome, this structure was created so that students did not go off task (Kirkpatrick, 2005; Contreras-Castillo et al, 2006) and so that the learning outcomes of the OSD could be achieved. As suggested by Mason (1991) and Lim & Cheah (2003) the TR provided social, organisational and intellectual support for the students, via the whiteboard function and text chat facility.

**PRESENTATION AND ANALYSIS OF RESULTS**

The analysis of questionnaire data from students and focus group was primarily aimed at generating evidence to answer key questions one and two of this study – student perceptions of the potential benefits and limitations of using OSD and their views on how this form of tutorial compares to f2f meetings. In addition, student opinion of the OSD would also provide useful recommendations (key questions 3) to those wishing to deliver CMC sessions in the future. Much of this evidence could be gleaned from the above methods as well as from the transcript of the OSD. Student names from the focus group and OSD transcript have been removed from the analysis to ensure anonymity. However, all other examples are presented verbatim.

**Benefits and limitations of OSD – Student perceptions**

The key aim of the tutorial was to support students in the preparation of a written assignment. In this respect, the TR was disappointed with student opinion in the
questionnaire relating to these aspects. Less than two-thirds of participants (62.5%) felt that the tutorial had helped them to answer the assignment question more fully. Furthermore, although over 40% of students felt confident or very confident to answer the question, 12.5% were still not confident. These initial findings concur with those of Burnett (2003) and Bromham & Oprandi (2006) who suggest that many small scale studies utilising CMC find disappointing results.

Given that the aims of the tutorial were closely linked to questions three to six in the questionnaire, the data in Table 1 presents similarly frustrating evidence. The figures do not concur with Chen et al’s (2005) findings that OSD’s similarities to classroom interactions make it a good choice for tutorial-based activities. In this instance the online tutorial failed to help a large proportion of students to unpick the question, understand the assessment criteria, identify key content and concepts or structure the assignment. Although the TR felt that these aspects were made explicit to the students via the use of the whiteboard function in the Live Classroom and the structure of the discussion, students completing the questionnaire clearly did not all agree. In all instances, less than one third of students claimed that the online tutorial supported their learning ‘well’ (Table 1).

Table 1: Effectiveness of the ‘online’ tutorial

<table>
<thead>
<tr>
<th>How well has the online tutorial helped you to…</th>
<th>Well (%)</th>
<th>Neutral (%)</th>
<th>Not well (%)</th>
<th>Mean* (± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. …unpick the question?</td>
<td>12.5</td>
<td>60.9</td>
<td>23.4</td>
<td>2.9 (0.7)</td>
</tr>
<tr>
<td>4. …understand the assessment criteria?</td>
<td>29.7</td>
<td>43.8</td>
<td>23.4</td>
<td>3.1 (0.8)</td>
</tr>
<tr>
<td>5. …identify the key content and concepts?</td>
<td>32.8</td>
<td>45.3</td>
<td>17.2</td>
<td>3.1 (0.7)</td>
</tr>
<tr>
<td>6. …structure the assignment?</td>
<td>31.3</td>
<td>37.5</td>
<td>26.6</td>
<td>3.0 (0.8)</td>
</tr>
</tbody>
</table>

* Based on a 5-point Likert scale: 5=very well, 4=well, 3=somewhat, 2=not very well, 1=not at all well
* SD = Standard deviation

On this evidence, it seems that the results contradict the suggestions of JISC (2006c) who claim that the use of CMC makes the process of learning more ‘visible’ for students and tutors. However, students in the focus group felt that the written nature of the discussion aided learning, suggesting that ‘because I’ve got it written down I understand everything I’ve got to do with the assignment’ (Participant 2). This shows that although the majority of students who completed the questionnaire felt quite negative, most within the focus group were very complementary and is borne out by the large standard deviation evident in all aspects of Table 1. This suggests that opinion varied considerably, and that many students had no strong feelings either for or against one particular type of tutorial (JISC, 2006a; Zhang et al, 2005).

A number of causes for these opinions can be found in an analysis of the focus group dialogue and the OSD transcript. Firstly, perhaps the number of students in the chat room prevented deep learning and caused excessive ‘chit chat’. In the focus group one participant acknowledged ‘I gave up following the discussion’ (Participant 1) because it got too difficult to follow the text. Zhang et al (2005) also found that OSD makes reflection and deep learning harder to acquire, whereas others have found much confusion and a lack of focus (Contreras-Castillo et al, 2006; Wang, 2005). The TR’s opinion is that the large number of students in the OSD prevented the achievement of Mayes & Fowler’s (1999) construction and dialogue levels as well as Salmon’s
(2004) knowledge construction and development stages. There was a lack of deep ‘scaffolding’ during the OSD, the majority of which facilitated only surface-level learning.

Further evaluation shows that many students were not taking the OSD seriously, and therefore provided little meaningful contribution to the tutorial. A brief analysis of the OSD transcript provides one such example of ‘off task’ behaviour:

A: ‘any1 fancy pizza hut tonight?’
P: ‘Rhyno ill go wat time’
A: 4ish?
P: ‘After lecture’
M: ‘Think about your figure’ P

These findings would concur with those of Kirkpatrick (2005), Williams (2002) and Contreras-Castillo et al (2006) who in William’s words found much ‘nonsense’ in the early stages of implementation. However, it must be remembered that this study was a ‘one-off’ tutorial, and Wenger (1998) has argued that much informal discussion is important in developing a ‘community of practice’. Kirkpatrick (2005) has also pointed out that the nonsense ‘quota’ did diminish over time, suggesting that it was student’s way of getting started with the new medium. Although students in the focus group felt that ‘Towards the end, people were asking more questions’ (Participant 2) it has not been researched how long the process of ‘acclimatisation’ to OSD takes, and should therefore be a focus of longitudinal research to discover the effectiveness of OSD over longer periods of time.

In line with the findings of Gunawardena & Duphorne (2000) it seems that the characteristics of the chat tools also caused some dissatisfaction, and may have prevented the achievement of the aims of the session. One student in the focus group would have preferred ‘bigger boxes [and] bigger writing’ (Participant 4) in order to be able to follow and contribute to the online discussion. This was prevented by the small size of the chat box within the application. Annoyance was also found by two individuals in the focus group whom were logged out of the tutorial part-way through discussion, similar to participants within Chen et al’s (2005) study. As the best predictor of learner satisfaction (Gunawardena & Duphorne, 2000) the OSD tools may have effected student perceptions of the use of an online tutorial considerably.

In contrast to the disappointing findings identified above, it was encouraging to find generally positive comments from the focus group participants. Although it is acknowledged that these volunteers would generally have been positive about their online experience, the TR feels that their comments were honest and reflective. For example, all participants agreed that the structure of the tutorial was effective and that the use of the ‘whiteboard’ function, in identifying different parts of the question and assessment criteria in matching colours, was excellent. The ability of the participants and tutor to paste hyperlinks into the chat box also added a rich multimedia experience that Walker (2004) claims will scaffold learning. These findings complement those discovered by JISC (2006c) regarding the opportunities available in OSD.
The focus group also identified that confusion was cleared up quickly by swift responses from other students and the tutor. Examples of this include responses to student’s queries on the assignment hand in date/time as well as for questions pertaining to referencing of sources. Pilkington (2004) claims that the ‘conversational style’ of OSD allows these interactions to occur. It was also suggested that ‘Having yours in block (meaning capital letters) it made it stand out’. Unfortunately, these advantages seem negligent to the TR given that the general consensus of the participants via questionnaire was not positive. However, because Tricker et al (2005) suggest that student surveys tend to invite criticism, the focus groups opinions should perhaps carry greater authority.

**Student perceptions of the use of an ‘online’ versus ‘face to face’ tutorial**

The above findings are generally mirrored when students were asked to provide their perception of how online and f2f tutorials compare. For example, although most participants were generally positive about the prospective effectiveness of the online tutorial, their perceptions fell dramatically following participation in the activity (Table 2). Although the majority of students (45.3%) felt that the OSD would be useful or very useful before the activity had begun, the majority of students following the session (43.7%) felt that it had not been a useful experience.

| Table 2: Student perceptions of the ‘online’ tutorial |
|-----------------------------|-------------------|-------------------|-------------------|-------------------|
|                           | Useful (%) | Neutral (%) | Not useful (%) | Mean* (± SD) |
| 7. What was your perception of how useful you thought the online tutorial would be before you participated in the activity? | 45.3 | 29.7 | 21.9 | 3.3 (1.0) |
| 8. How useful did you actually find the online tutorial today? | 40.6 | 12.5 | 43.7 | 2.9 (1.0) |

* Based on a 5-point Likert scale: 5=very useful, 4=useful, 3=no opinion, 2=not very useful, 1=not at all useful. ± SD = Standard deviation

Similarly, Table 3 provides the data to show that f2f methods for conducting a tutorial were the preferred medium for the majority of students both before and after the OSD. In contrast to the other findings of the study, student preference for online tutorials increased (marginally) from 7.9% to 12.7% following the session. This is accounted for by one student moving from ‘no preference’ and four students from ‘f2f’ to now preferring ‘online’ tutorials. Although f2f sessions are the preferred method for this group of students, it seems that similar to Zhang et al’s (2005) research, there is considerable ‘indifference’ in opinion.

| Table 3: Student perceptions of ‘online’ and ‘face to face’ tutorials |
|-----------------------------|-----------------|-----------------|-----------------|
|                           | Online (%) | f2f (%) | No pref (%) |
| 9. Before the online tutorial today did you prefer a face to face or an online tutorial? | 7.9 | 60.3 | 34.9 |
| 10. After participating in the online tutorial today do you prefer online or face to face tutorials? | 12.7 | 54.0 | 33.3 |
The potential for future investigation into the use of OSD is also relatively positive, given that over 56% of participants would like to participate in future online tutorials. However, given the students lack of positivity about the effectiveness of the OSD, one could assume that the students enjoyed the activity, but did not learn a great deal. This has been the case for several studies (Cox, Carr & Hall, 2004; Im & Lee, 2004) who have found OSD more useful for generating informal discussion and for co-ordinating activities between classes. Kirkpatrick (2005) also found the tool too playful to support ‘real learning’ whilst others claim that the use of IM and chat rooms for socialising make its use in educational settings difficult (Hu et al, 2004). However, it must not be forgotten that motivation plays a big part in student learning (Yacci, 2000; Contreras-Castillo et al, 2006) and that affective benefits may be just as important as content learning in order to promote independent and inquisitive learners.

The data from the focus group provided more positive feedback for online tutorials, when comparing them to f2f sessions. It was agreed by all participants that the online activity allowed them to learn from other student’s questions and gave them extra ideas to add to their assignment. Interestingly, they acknowledged that ‘Some questions were asked that I had not considered’ (Participant 6) showing some faith in the idea of socio-constructivist theories. Agreement was also established that they didn’t feel that the ‘off task behaviour’ detracted from the learning, but the quantity of discussion made meaningful dialogue confusing. These students, like Contreras-Castillo et al (2006) clearly thought that a smaller group tutorial would have been far more effective.

Five out of six focus group participants also showed preference for the online tutorial over f2f sessions. General feelings are summarised well by the following extracts:

‘I probably prefer online because if you’re not face to face you don’t have the thing of having to look at others’ (Participant 5)

‘In a lecture there’s no way I’d put my hand up and ask a question, whereas on here no-one can see you’ (Participant 4)

Despite their preference, each of these students considered face to face interactions as ‘essential’, and would not like online tutorials to replace face to face opportunities to work with tutors and students. Furthermore, one student in the focus group insisted on his preference for f2f tutorials, claiming he gets questions answered more effectively on a one-on-one basis, and does not have to worry about ‘…mis-reading others written comments’ (Participant 3). Despite the preference for f2f tutorials, some students clearly demonstrate similar characteristics to those in Tanner & Jones’ (2000) study who found that many individuals do not like contributing to discussions or asking questions in f2f environments. For these individuals, the OSD provided an effective medium to ask questions and to contribute to the ongoing dialogue.

When students in the focus group were asked about their relative contribution in the online tutorial compared to normal f2f sessions, it became clear that many had taken the decision to ‘lurk’ rather than ‘work’ (Taylor, 2002). One student claimed ‘It’s easier to read other people’s questions and answers’ (Participant 1) suggesting a lack
of empathy with the concept of ‘communal constructivism’ (Holmes & Gardner, 2006). However, another individual claimed that ‘I didn’t actually write much because I got so confused trying to read’ (Participant 5). This suggests that again, the group size limited meaningful student contribution to the activity. Finally, contribution from a third student in the focus group, and consistent with findings in the OSD transcript, was that the only point in which they contributed during the tutorial was in the initial ‘ice breaker’. Therefore, although the TR felt that he had fulfilled the social, organisational and intellectual roles identified by Mason (1991) and Lim & Cheah (2006) it appears that other issues were preventing the effective participation of students.

CONCLUSION AND RECOMMENDATIONS

This study has reviewed the literature in the area of CMC, and in particular, the use of OSD in order to increase the quality of its use within VLE’s. Student perceptions of an online tutorial and comparisons with f2f discussion have also been sought in the hope that lessons can be learnt.

Wang (2005) suggests that the current debate in education is no longer whether information and communications technology (ICT) should be introduced into teaching and learning, but on how and when it should be used. This will require the educator to understand the variety of TEL opportunities as well as the pedagogical requirements of a given learning environment. It is suggested that those wishing to utilise VLE’s for more than e-administration and e-content management (Britain & Liber, 2004) should continue to follow published recommendations as well as conducting their own research with their students. The following recommendations (summarised in Figure 6) should also be considered before the delivery of OSD in order to enhance the learning of their students’.

1. Tutors of online learning should be guided by the suggested roles of Mason (1991) and Lim & Cheah (2003) and by the recommendations of Mayes & Fowler (1999) and Salmon (2004).

2. The scaffolding of student learning should be encouraged through the use of open (Wang, 2005) and devils advocacy style (Walker, 2004) questions.

3. Group sizes should be limited to numbers in which meaningful discussion can be acquired (Contreras-Castillo et al, 2006).

4. The OSD application should be ‘fit for purpose’. Select the application based on your medium of communication rather than picking the most elaborate application.

5. Tutor’s should receive training in how to manage learning using technology, and in particular, how to help students get the most from OSD.

6. Students should be ‘inducted’ into the use of OSD through f2f and online sessions that will provide them with suggestions, guidelines and ‘unwritten rules’ for how to behave in an online environment. Comparisons with social communication

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applications should be made so that students are aware of the similarities/differences in the environments.

7. The most effective benefits will be found if the use of OSD is part of an integrated approach and is used over sustained periods of time.

8. OSD should mainly be used to complement f2f interactions when geographical constraints prevent such opportunities, such as when students are on work placement, school experience or during holiday periods.

Figure 6: Roles, models and recommendations for delivering OSD

<table>
<thead>
<tr>
<th>Mason’s three responsibilities for the online tutor</th>
<th>Lim &amp; Cheah’s six important roles of the tutor in asynchronous discussion boards</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCIAL</td>
<td>ORGANISATIONAL</td>
</tr>
<tr>
<td>Effective open discussion requires a safe, supportive environment.</td>
<td>Ensures students can access discussions and manage dialogue.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Keep the discussion focused.</th>
<th>Set meaningful tasks.</th>
<th>Answer queries, provide feedback and pose conflicting views to elicit thinking/reflection.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Guide participants in the ‘technicality’ of online discussion.</td>
<td>Draw conclusions and provide content expertise.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recommend resources for extension of learning.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mayes</th>
<th>Salmon</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Dialogue/Application</td>
<td>5. Development</td>
</tr>
<tr>
<td>2. Construction</td>
<td>4. Knowledge construction</td>
</tr>
<tr>
<td>1. Conceptualisation</td>
<td>3. Information exchange</td>
</tr>
<tr>
<td></td>
<td>2. Online socialisation</td>
</tr>
<tr>
<td></td>
<td>1. Access and motivation</td>
</tr>
</tbody>
</table>

Open and devils advocacy questions

Which OSD application?

Tutor Training

Minimise group sizes

Student induction

Integrate CMC across the degree programme

Utilise when geographical constraints prevent f2f discussion

It is clear that the sample of participants involved in this study were a unique group of students, making generalisations to other populations very difficult. It is also apparent that despite a high number and percentage of students completing the questionnaire, only six students were involved in the focus group. Perhaps if open questions had
been added to the questionnaire the study would be able to provide a fuller range qualitative data.

Future work should be considered with other campus-based undergraduate students. It was unknown whether the ineffectiveness of the OSD was due to the size of the group, the one-off nature of the tutorial, its similarity to other social communication applications, the inappropriate size of the chat box or other factors. The use of OSD should therefore be explored controlling these variables, such as with smaller groups or over longer periods of time.

Because of this and other studies disappointing results, the use of OSD should also be considered in other contexts, such as where students are prevented from participating in f2f interactions because of geographical constraints such as during work placements or school experience. This could also utilise the more advanced CMC tools, such as audio and video that this study was not able to explore.
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