Online discussions: Promoting effective student to student interaction

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Teachers and students are increasingly comfortable with the use of technology for communication, but are still grappling with strategies to ensure their effective use and achievement of quality outcomes. Research on computer mediated communication (CMC) has focused on the teacher's or e-moderator's role in facilitating the use of CMC and not how the student can achieve effective student to student interaction. This paper explores the impact of orientation sessions that specifically target the dynamics of online learning in groups. Salmon's conference analysis categories were used to analyse the content of postings made by undergraduate orthoptic students in an asynchronous discussion forum in 2003 before the introduction of these orientation sessions. This was compared with postings made in 2004 in the same units of study following these sessions. Results in 2004 showed significantly fewer postings at the level of individual thinking and more postings at the level of interactive thinking. This fostered productive conferencing, with active involvement of the students without the usual time commitment that is required by the e-moderators to achieve successful learning outcomes.

Keywords: CMC, interactivity, group learning, online, conferencing

Introduction

Technology is increasingly being embraced as an efficient tool to provide increased flexibility for learners in the higher education environment. CMC is one technology that has received considerable attention for its ability to promote deeper learning and collaboration between students. Asynchronous discussion, a form of CMC, allows flexibility by students controlling when and where they post and reply to messages in a discussion forum. It promotes a collaborative learning environment where learners interact by negotiating, debating, reviewing and reflecting upon existing knowledge, and are able to build a deeper understanding of the course content. (Vonderwell 2002, Geer 2003). This differs from face to face discussions because the learner is freer and less intimidated and has the opportunity to make more in depth contributions.

Asynchronous discussion does however have its problems. Studies that have analysed the level and type of interaction used by students in asynchronous discussions have concluded that students do not take full advantage of the opportunities available to them, and that the e-moderator needs to devote considerable time overseeing the process. Researchers report that messages were often left unanswered by fellow students (Vondervell 2002, Ellis 2001), and learners can easily adopt the role of "lurker" rather than actively participating in the discussion (Hara, Bonk, Angeli 2000). There is a strong perception amongst those who use CMC tools that considerable ongoing e-moderator support is required ranging from assisting students with navigation, clarification of expectations, stimulating critical thought and provision of encouragement (VandeVusse 2000, Wu 2004).

Many researchers conclude as Geer does that "there is a need to provide more guidance to students to ensure a richer and more active engagement with the topics" (2003, p201). When analysing conferencing media more generally Laurillard (2002) concludes "None of the existing studies suggest that this is the kind of medium where students can be left to work independently" (p151).

In contrast to Laurillard's comment, Salmon (2000) demonstrates that with carefully structured CMC activities students are able to become autonomous learners in the online environment. She has developed a 5 stage model of teaching and learning online that describes the stages students pass through to

independently use CMC tools. The model focuses on the role that the e-moderator plays in designing what she terms "e-tivities" to assist the student to progress through the steps of accessing the CMC tools, online socialisation, exchanging information, conferencing to construct knowledge and finally critical thinking where the learner adopts responsibility for their own learning with little support. There has been little research that specifically looks at the type of instruction required for students to interact effectively with each other beyond describing the role of the e-moderator during asynchronous discussion.

The context

From 2000 to 2004 the School of Applied Vision Sciences at the University of Sydney has been using the WebCT learning management system in blended learning contexts. The asynchronous discussion feature is used in 2 units of study to facilitate the translation of academic knowledge into clinical practice for 3rd year undergraduate orthoptic students. Small private discussion groups of up to 8 students are formed, and clinical cases with a series of questions relevant to the subject content were provided by the two e-moderators (authors of this paper). Students post their ideas about each case, formulate a group response and then receive feedback from the e-moderator on their answers (consisting of individual feedback on the group answer and a set of "model" answers.) This occurs throughout the semester with the time required to complete the group response varying from 2 to 6 weeks. In addition each student is responsible for preparing a case (case details, questions and answers) to be used in their group and moderating the ensuing discussion.

Students attend an orientation tutorial which gives an overview of the complete WebCT site and are given practice at writing and posting messages. Clear guidelines are provided to the students including a calendar of deadlines. Participation is compulsory and forms 10% of the total assessment of each of the 2 units of study. Since we are from a very small academic unit with limited resources, students are made aware that constant e-moderating of the discussions during the semester will not occur; an aspect which has been considered to be very important for the success of CMC tools.

Methodology

Hara et al (2000) and Meyer (2004) when reviewing CMC research highlight the need for careful qualitative research and content analysis of individual postings since quantitative studies that merely count the number of postings may not necessarily lead to an understanding of what actually happened in the interactions. The original pioneering work regarding content analysis made by Henri (1992) examines many dimensions. We used an approach similar to that of Lambert (2003) to quickly determine what Henri had originally labeled the cognitive and metacognitive dimensions of the interactions. We decided to use Salmon's (2000) Conference Analysis Categories since our e-moderator roles were modeled on her 5 stage model described previously. The 2 levels "individual thinking" and "interactive thinking" are roughly aligned with Henri's cognitive and metacognitive dimensions respectively. This research is based on the postings made by 20 students in 2003 and 35 in 2004.

Content analysis of student interactions in 2003

Although students enthusiastically embraced the online learning opportunities stating that "the feedback (is) excellent", it is "enjoyable conferring with peers", and it "helped thinking outside square", the e-moderators felt that the students did not take full advantage of the collaborative environment. It was noted that students tended to post their individual ideas, rarely commenting or building on the ideas of others in their group. Table 1 outlines the categories that are identified at each of these levels with examples of postings that were categorised at each level. It also shows the number and percentage of postings in that category for the period covering the 1st semester of 2003 for both units of study. The column describing the results of the 2004 analysis will be discussed later in this paper.

An overwhelming majority of postings occurred in categories 1 to 5 (93%) demonstrating individual thinking, and only a very small number demonstrated "interactive thinking" categories 6 to 9 (7%). It was also noted that students did not correctly thread messages and the discussion site became a messy list of individual contributions making the tracking of the discussion content difficult. Students commented there was "not enough discussion of opinions", "not all students were involved", the activity was "time consuming - didn't have time to comment on other's contributions". Given the structure of what appeared on screen this was not surprising! On reflection it became apparent that the e-moderators should not only

Table 1: Analysis of student interactions in 2003 & 2004

Category			2003	2004
Individual thinking		Example of posting	706 (93.4%)	506 (53.4%)
1.	Offering up ideas or resources and inviting a critique of them	"After working through the information I came up with the following… have I got this right?"	306 (40.5%)	141 (14.9%)
2.	Asking challenging questions	"Would that process…anyone know?" "I understand about…but how did that apply to…"	61 (8%)	105 (11.1%)
3.	Articulating, explaining and supporting positions on issues	"I agree that…, this is backed up by the reasons in previous messages", "yes that's what I got…"	248 (32.8%)	157 (16.5%)
4.	Exploring and supporting issues by adding explanations and examples	"There is a link on… if anyone needs to read about it (web address added)"	63 (8.3%)	69 (7.3%)
5.	Reflecting on and re-evaluating personal opinions	"Sorry about that…I went to check up my notes,… that means I've been…wrong all this time!", "yes you were right, sorry my mistake I go confused and was…"	28 (3.7%)	34 (3.6%)
Interactive thinking			50 (6.6%)	443 (46.6%)
6.	Offering a critique, challenging, discussing and expanding ideas of others	"Another point to consider is…", "I thought Q1 was actually asking for…so maybe you could ask…"	18 (2.4%)	171 (18%)
7.	Negotiating interpretations, definitions and meanings	"I agree with your comments so far giving…. As (lecturer's name) told us (definition provided) so we should also take into consideration this process…".	5 (0.7%)	125 (13.2%)
8.	Summarising and modeling previous contributions	"Ok here are the group answers…gathered from what everyone has said and agreed upon", "so the general consensus is that we'd use…because…"	22 (2.9%)	!01 (10.6%)
9.	Proposing actions based on ideas that have been developed	"Feel free to let me know if something needs to be added or if there is not enough detail", "maybe we need to nominate a group leader", "everyone, when you come online go straight to the chat room and…"	5 (0.7%)	46 (4.8%)
Total number of postings			756	949

provide feedback on the product that each group produced, but also give guidance on how to make better use of the medium - how to respond to peer's contributions, how to thread messages. This is similar to the results noted by Ellis (2001) who suggested that "in hindsight training in the use of a threaded discussion is needed" (p175).

Research conducted in online learning suggests that students will not collaborate unless collaboration is structured into the course. Students may just present their information without considering the thoughts of others. (Dysthe 2002) This was evident by the fact that there were so few postings categorised at the interactive levels of Salmon's model.

Vonderwell (2002, p.88) makes the comment

> students need to learn to adapt in order to gain learner autonomy as well as learn strategies for effective collaboration. Group processes and how collaboration can be facilitated need to be taught to students during their education.

Despite the drawbacks described above, the correlation between the on line assessment mark and overall subject mark was high in one unit of study (0.735, p 0.00) and moderate in the other unit of study (0.474, p 0.035), indicating that learning occurring in the online environment was transferred to similar activities occurring in the face to face environment (Silveria & Wozniak, 2003). The relationship between the learning that occurs in the online learning environment and the traditional classroom in blended courses such as those studied in this research has been given little attention in the literature. Wu (2004) reviews the available work in this area, but like many previous studies uses student evaluations of their online learning experiences to measure learning outcomes. Wu concludes that there are many variables such as the instructor's role, degree of guidance given, structure of the discussion topics, and students' learning styles that may contribute to the predictability of learning that results from asynchronous online discussions. Webb et al (2004) noted a correlation between the number of postings made by students and number of times they access the postings of other students and their assessment results. She did not however examine the content of the postings. Establishing a causal relationship between these many factors is an area requiring considerable further research.

Preparing students to interact with each other in online environments

In 2004, to facilitate greater student to student interactivity, the e-moderators developed a series of tutorials conducted at the commencement of the semester, that aimed to orientate students to the online environment and promote the need for meaningful discussion through engagement with other students. The orientation sessions described in the context section were extended to include:

- An introduction of Salmon's model of e-learning to the students
- A reflection activity where students were asked to consider their previous online experiences and rate their current level of proficiency on Salmon's model
- Clarification of the purpose of the asynchronous discussions
- Research results from 2003 showing a correlation between online assessment and exam results
- The impact that "lurkers" can have on group collaboration
- A discussion where students posted their ideas about a practice case in the first week. Then in the second week students analysed the timing of their postings, threading of messages and cognitive level of messages
- Clearly outlining to the students the expectation that the e-moderator would not be involved in the day to day student interactions

Student participation was again incorporated into the assessment for the units of study in 2004 but was more closely aligned with the theme of the orientation sessions. Instead of a more quantitative measure of the "number of student postings" used in 2003, students engaged in greater analysis of their online learning experiences by providing a reflection report analysing the quality of their postings. This self evaluation exercise asked the student to nominate 3 key postings that demonstrated any of the following characteristics:

- Timely posting that allows adequate group conferencing before deadlines
- Posting helps to promote further interactions with other group members
- Posting demonstrates their role in providing feedback to group members

Students had to justify their choice for each characteristic, and in addition, comment on their level of interactivity based on Salmon's 5 stage model, and how reflection on this experience will affect their future e-learning participation. It is possible that any change in interactivity could be a result of both the new orientation sessions and the assessment requirements.

Content analysis of student interactions in 2004

Only the first 6 weeks of the semester 1, 2004 were used in this analysis since the number of postings overall mirrored that number that had been made in the whole of the semester in 2003. Analysis of these interactions outlined in the final column of table 1 showed an increased level of interactivity with a much more even spread of individual and interactive thinking (53% and 47% respectively). A Chi square test of independence showed a statistically significant difference in category usage between 2003 and 2004 ($P<.001$). The improvement in student to student interaction is clearly demonstrated by an increase in the percentage of postings that were categorised as 6 to 9 on the scale described earlier. The ability of students to build on the contributions of others, and work collaboratively in the online environment was clearly evident by analysing the content of the extended threads constructed by the students for each case discussed.

Students again commented positively on the e-learning experience, particularly how much they had learnt from their peers. It was also noted that the discussion page was much more organised with students threading messages as described in the guidelines provided to them in the preparation activities. Mazzolini and Maddison (2003) have also found that deeper learning was associated with longer threads in online discussions. In contrast to 2003 there was no significant correlation between the online assessment scores and final exam scores. Further analysis of both these aspects constitutes further works in progress.

Conclusion

In a time poor work environment, it is easy for academics to avoid learning activities such as CMC which they perceive will place high demands on their time. This is because students who collaborate effectively

in face to face sessions will not automatically demonstrate such abilities online. This research has shown that when CMC is well structured with initial student orientation to the online learning environment and learning activities showing them how to use asynchronous discussion efficiently; more effective student to student interactivity takes place.

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