Learning through Question and Answer Interactions on the Web.

Dr Sandra Schuck,
Faculty of Education, University of Technology, Sydney

Abstract
The paper discusses the use of a Question and Answer section of a Discussion Board on a computer-mediated web conferencing tool, and the way in which this facility fits with ideas of social learning. A description will be provided of how learning was developed through questions and answers in this subject and insights will be shared regarding the various uses of this facility by the students. Issues related to participation, peer misconceptions and teacher intervention are raised and discussed.

1 Introduction
Over the last two decades, education has been undergoing major paradigm shifts. These shifts include changes in theories of learning from transmission to constructivism and moves from teacher-centred to student-centred control of learning situations [1]. In our mathematics education subjects we employ computer-mediated conferencing as one of the means of challenging student beliefs about learning, teaching and mathematics education [6]. This paper focuses on the pedagogical value of using a Question and Answer facility in computer-mediated conferencing.

It is becoming increasingly common for teacher educators to base their teaching philosophies on principles of social learning [4]. Social learning situations involve learners in actively constructing meaning, not in isolation, but in collaboration with others. Salomon and Perkins [5] suggest that learning usually entails some social mediation. They elaborate on the concept of social mediation as participatory knowledge construction, whereby learning is seen as “a matter of participation in a social process of knowledge construction” p 4. This paper focuses on this form of learning and discusses how a question and answer forum can contribute to shared knowledge construction.

1.1 How question and answer forums fit in a view of social learning.

This paper discusses the use of a Question and Answer discussion forum created in a web-based conferencing tool. For me, the introduction of a Q&A section fitted well with my socio-cultural theoretical framework for teaching. I believe in the importance of communities of learners and in opportunities to create rich questions or to encourage students to pose their own questions for investigation. In what follows I discuss this use of the Q&A facility and also raise issues about participation and teacher roles.

2 The Study
First year primary teacher education students at an Australian university are enrolled in a mathematics education subject in their second semester. The subject is primarily offered in face-to-face mode on campus, but also involves the use of a computer mediated discussion tool. A Question and Answer forum has been placed on the discussion board and students are encouraged to post questions about the use of the technology or about the content of the subject, the study of measurement. Students are also encouraged to respond to any of the questions or statements made in this section. In this way students act as advisers for each other, or share ideas on any of the issues raised in class.

The Q&A activity reflected the shifts in teaching advocated by the reform movement in school mathematics. These reforms encourage students to work as mathematical communities and to use logic and mathematical evidence as verification, rather than accepting the teacher as sole authority [3].

In the study, I considered the experiences of the students over two offerings of the subject, in consecutive years. I evaluated the Questions and Answers section by monitoring the content that appeared in this section of the Discussion Board. We also had a mid-semester evaluation in which students were asked to evaluate aspects of the subject and in particular, the Question and Answer section. These evaluations were anonymous. For this paper, I will discuss some of the issues raised and also outline some examples of powerful learning that took place through the Q&A facility.

2.1 Findings from the Question and Answer section of the discussion

About 40% of the 150 students used the Q&A forum. Of those who did, 66% found it interesting and worthwhile. Those who were critical of its use expressed a number of views: some felt that they had nothing to say and were being coerced into using the discussion as it would give the lecturers a good impression of them, others were concerned that their peers’ answers to questions might be incorrect and they did not feel able to assess whether this was the case.

As a result, usually a core of students would participate in the online discussion. For these students, there were benefits. However, those who did not visit the discussion site...
at any point did not view such interactions as meeting their needs. This point matches the findings of Selwyn [7] who had similar experiences in a network of special education teachers. It supports the view that electronic learning environments do not suit all learners [2] and the opportunity to learn in different ways, using different tools and approaches should be offered to all learners.

For those who did participate in the Q&A section, their interactions appeared to be useful and resulted in some powerful learning for some of the students. An example of such an interaction follows.

A question had been posed in class as to how the area of an irregular shape could be measured. A student (George) responded by suggesting a solution in which the area and perimeter were seen as in directly related, thus suggesting that finding one would lead to the solution of the other. I asked students to think about George’s solution and respond with their thoughts in the Q&A forum. The first response in the forum was along the lines suggested by George, arguing for finding the perimeter to find the area. In response to this posting a number of other responses appeared, each with a very clear explanation of why the area could not be found using the perimeter. A very convincing explanation by George who had reflected on his earlier suggestion and was able to show its flaws, ended the discussion, as all reading it acknowledged that it was compelling and clear. To me, this discussion demonstrated the strength of the tool for developing collaborative learning and for promoting deeper thinking.

It is worth noting that the 13-day long discussion terminated after George’s clear response. Students’ concerns about not recognising whether a solution to a question was valid or not were dispelled when they read George’s response. So his response in fact cleared up two misconceptions for the students, one regarding the area of irregular shapes and one regarding students’ abilities to discern when an argument made sense.

2.2 Other examples

Some of the questions were about use of the technology, for example, questions about how to change passwords or how to print. Students were quick to respond to their peers and seemed to take some pride in knowing how to help.

Other examples enabled students to share teaching ideas when they were on the practicum in schools. One student asked for ideas on teaching a particular topic and was answered by a number of students all offering ideas and suggestions and reporting on their experiences. The discussion was useful in developing students’ ideas for teaching. The students appeared to be eager to support one another in the suggestions they offered.

The above are only a few of the examples of the diverse way the Q&A forum was used. In the next section the benefits of such a forum and the issues arising from its use are discussed.

3 Discussion

The Q&A forum had much to offer in the way of collaborative knowledge construction. Students valued their peers’ opinions and learnt from each other, both about mathematical concepts and about teaching these concepts. It was clear to students when input was authoritative. So the Q&A forum was instrumental in developing a community of learners. The role of the teacher here was to set up some of the problems, to ensure that conceptual understanding of content was being developed, and to act as an observer of the activities, only stepping in when absolutely required.

However, an issue regarding participation needs to be considered. Although the forum was used regularly and was found to be extremely useful to many of the students, there was also a large number of students who did not access the forum at all. These students gave reasons for not accessing the forum as not enjoying using this technology, not having time or not seeing the need for it. These reasons need to be respected and I believe that unless students can see value in using a particular approach to learning, that they should not have to use that approach. This suggests that those students who prefer to interact in other ways should be encouraged to do so and alternative ways of learning should be provided in all subjects. A respect for individual differences is central to ideas of effective education.

4 References

4 Putnam, R., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teaching? Educational Researcher, 29 (1), 4-15