Evaluating the Effectiveness of On-line Discussions in Education

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Objective:

A critical look at how one technology, specifically on-line discussion groups, can be utilized to assess students' learning.

Theoretical Base:

Consensus is growing that the use of educational technology in and out of the classroom is not only inevitable, but it has the potential to serve as a powerful tool in the quest to improve the educational process for all learners (Edwards, 1997). However, while schools had 5.8 million computers in 1995, less than half of the teachers regularly use computers for instruction (Office of Technology Assessment, 1995). Research shows that helping teachers learn how to integrate technology into the curriculum is a critical factor for the successful implementation of technology application in schools (Cradler & Parish, 1995) and most teachers have not had the education or training to use technology effectively in their teaching (Education Week, 1997). Therefore, it is the responsibility of teacher-educators to train future teachers not only to be comfortable with technology, but be able to apply technology in ways that are matched to curricular goals and national standards. Faculty must develop teaching and learning activities that capitalize on the features of technology that expand student understanding (Garofalo, 1998).

The use of e-mail and Web-based discussion groups are not new to education, and have been found to be effective methods extend learning activities beyond the classroom. Van Gorp (1998) found that a Web-based discussion tool, Class-net, could be used successfully to enable pre-service teachers to interact with elementary and secondary students. Kubala (1998) found that students were more willing to participate in class discussion and other online learning activities as compared to traditional modes of discussion. In a project (sponsored by Toshiba America and Microsoft) that gave teachers laptop computers, teachers' modified their teaching styles and approaches to instruction and found positive changes in students' attitudes, motivation, and behavior (Rockman ET AL, 1997).

The use of on-line discussion groups offers a relatively new avenue through which the learner can take an active role in the learning process. Furthermore, on-line discussion groups are one form of computer-assisted communication that can promote interactive engagement of the learner with the content being studied. In addition, on-line discussion groups may offer some students a more "comfortable" environment in which to interact than the traditional large lecture class. In addition, on-line discussion groups may appeal to students with diverse learning styles.
Method:

This study was initiated to allow an opportunity to assess the potential effectiveness of on-line discussion groups as a learning and assessment tool. Participants in two courses offered during the spring of 1998, an introduction to technology in education, and a general education physics course, served as subjects.

Uses of Technology in Education is an introductory course designed to demonstrate the use of technology for educational purposes. In this hands-on course, pre-service teachers design instructional web-sites, evaluate educational software, create multimedia educational materials, and study technology-based purchasing decisions. Thirty-two students were enrolled in the course during the Spring 1998 semester, and participants included undergraduate and graduate elementary and secondary pre-service teachers, education doctoral students, and students from other academic departments such as communication, business, and foreign languages. All students in this course were required to participate in the on-line discussion component of the course.

Physics for the Modern World is a one-semester, algebra-based, introductory course for non-science majors at American University. Students elect to enroll in this course to satisfy a portion of the University’s Natural Science Requirements toward graduation. The spring 1998 sections of the course consisted of 124 students from 25 states and 22 countries. The course is fairly traditional in its introductory-physics content. However, in terms of instructional delivery, a variety of techniques were employed to attempt to address the diversity of student learning styles. Early in the semester, the introductory physics students were asked to indicate whether or not they would be interested in participating in a voluntary on-line discussion group during the semester. Sixty-two students volunteered to participate in the on-line discussion group.

In the educational technology course, students posted (sent via email) questions to a listserv discussion group each week. In the first week, the instructor posted a “model” question, and each student responded to the question within one-week of the posting. Following a schedule established on the first day of the course, one or two students posted questions related to using technology in education each week.

In the physics course, the instructor posted discussion topics to the listserv. Throughout the semester, the instructor served as a guide and facilitator of student responses to the discussion questions and for exam-review questions posted by the students.

Results

At the end of the spring 1998 semester, students participating in the on-line discussion groups were given a survey (n = 68) to assess the effectiveness of the discussions in terms of their understanding and perceptions of the course content.

Students were asked what they found most valuable when reading the responses of others. Some sample responses (from both classes) were:
• “I became aware of different points of views. In addition, sometimes I didn’t have any idea on the subject so discussions were a good start for me!”
• “I got a chance to hear many different perspectives on important issues.”
• “It provided the chance to do research on the web and share others perspectives.”
• “I enjoyed reading people’s responses because it helped me to understand the concepts and the questions in the homework.”
• “I was able to see aspects of a concept I might not have thought about when answering a question.”
• “That people are interested in the class and therefore interested in giving their opinions about the topics discussed.”
• “I found that others have the same questions as I. I found that looking at other responses helped me to answer the question I had because there were often more than one answer or way to solve the problem.”

On the survey, 85% of the students who participated in the discussion indicated that the topics discussed changed or influenced their opinions, and 100% indicated that their knowledge of the content improved. In the educational technology course, 72% of the students indicated that they would use a discussion group in their own teaching, for such reasons as:

• “To get my students to actively research a specific issue or topic.”
• “To allow students to express their ideas without worry of immediate backlash.”
• “To help them learn how to use email!”

In the educational technology course, the survey included a question that queried students’ opinion of the fairness of the assessment in the online discussion. 100% of the students responded that they felt the assessment was fair. Comments to this question included:

• “We were graded according to content and apparent effort.”
• “I think it’s very hard to assess a tool like this. Assessment was fair.”
• “Because you could not just say anything and get away with it. You had to think a refer to a site or reference.”

Conclusions

Overall, the results of this survey suggest that students found the on-line discussion beneficial and useful to them. Many students felt that the on-line discussion format should be continued in future classes. However, the majority of students in the physics course responding felt that participation in the discussion should remain voluntary. The most common rationale supporting voluntary participation was that students felt there was already sufficient activities (i.e. homework, labs, folders, etc.) required in the course. Other students simply felt that students should be allowed to choose whether or not they want to participate in the discussions. In addition, students felt that there were benefits to active as well as passive participants on the list.
Student participation in the on-line discussions uncovered a great deal about their conceptions (as well as misconceptions) regarding the content studied. In the educational technology course, students' discussion focused primarily on issues such as pornography, students with special needs, equity in the areas of access to and representation in educational technology, and privacy on the Internet. The on-line discussions in the physics course provided a vehicle for the instructor to offer frequent feedback (and redirection, as necessary) to the students. This feedback provided additional incentive and encouragement for students to go beyond their current level of thinking and explore the topics in greater detail. Through the discussion of key physics concepts in this non-threatening learning environment, students were able to make deeper connections between physics and their own lives, thus enhancing their worldview.

**Educational Importance**

Technology, such as on-line discussions, must be carefully evaluated before being implemented into the curriculum. As with other types of technologies, from video simulations to computer-based tutorials, the instructor must be comfortable with not only the medium, but also the message sent through the medium to the students. In an on-line discussion, the instructor must carefully monitor students' statements about concepts and redirect them as necessary. Monitoring the discussions requires time and commitment on the part of the instructor, as well as a desire to assist the student to come to a deeper understanding of the concept itself. It is our opinion that this is time well spent. As seen with the discussion of weightlessness in the physics example above, the instructor’s role is often to not only provide the opportunity for in-depth investigation into a topic, but also to provide constructive feedback as it develops. In this way, the instructor can better integrate electronic discussions to help students come to a deeper and broader understanding of concepts from physics to equity in education.

The process of writing allows students to gain greater understanding of the concepts that are presented in class. Through this approach, students communicate with each other (and with the instructor) regarding various topics and principles, and, are often better able to connect these topics to their everyday lives thus facilitating the acquisition of higher-order thinking skills. In addition, one is able to see how students become more adept at transferring and applying information learned in class to novel situations. Through the use of an on-line forum, the potential exists for students to achieve greater understanding and more meaningful reflection. Further research on the impact of on-line discussion forums to long-term understandings and perceptions as well as a comparison to more “traditional” methods of instruction is warranted.
References


Cradler, J. and Parish, E. (1995), Telecommunications and Technology in Education: What have we learned by Research and Experience? Sacramento: WestEd Regional Laboratory.


