Distance Education, Its Not For Everybody

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Distance education is here to stay, yet many questions remain open. Will it create a better educated populace? What are the costs? Who will benefit? In a recent issue of *The Montana Professor* Governor Racicot's high expectations for distance education include: "increasing the number of continuing education opportunities for adult learners, articulating degree requirements across university campuses and state lines, awarding degrees and certificates based on competency rather than seat times, and providing educational opportunities for students regardless of their physical location." (Racicot, pg. 2) In the same issue Plank and Edgerton see very different outcomes. "The rural poor will get a watered down, inferior, computer-based, vo-tech education and will remain impoverished because they won't have the skills or analytical education needed to compete for good jobs, while the urban wealthy at the universities will continue to advance and buy ranchettes and summer homes in Montana." (Plank, pg. 8) I take the middle ground with MacGregor who responded that distance learning is "less radical a solution than the governor believes, and less frightening a portent of totalitarian disaster than Plank and Edgerton believe." (MacGregor, pg. 16) MacGregor characterizes distance education as a toolbox whose tools need testing on old and new tasks.

Towards this end I performed an experiment last year to test the effectiveness of using electronic mail for discussing ethical issues. "Computer Ethics" is part of a two-semester software engineering course that I have taught for the last five years. In this experiment, I replaced class discussions on computer ethics with on-line discussions exchanging email messages. I found that moving the class discussion to an on-line format vastly increased my workload. Furthermore, it appears that for highly interactive and discussion-type material, the distance format demands smaller class sizes and increased facilitation time. It also makes motivating students more difficult than in a traditional classroom.

Experiment

Classroom discussions are a vehicle to help students think critically and develop their conceptual frameworks. *Science Teaching Reconsidered* reports that "The give and take of technical discussion … sharpens critical and quantitative thinking skills. Classes in which students must participate in discussion force them to go beyond merely plugging numbers into formulas or memorizing terms. They must learn to explain in their own words what they are thinking and doing." (Committee, pg. 14) Albert Oosterhof of the *Corporation for Research and Educational Networking* claims that "the use of e-mail messages seems to encourage dialog with students, much of this in the form of e-mail initiated by the student." (Oosterhof)

Feeling frustrated with the quality of the traditional class discussions that I facilitated, I decided to try slower paced email discussions. My in-class discussions were frequently dominated by a few outspoken class members, and sometimes these dominant

contributors were poorly versed in the material. I felt that female and minority students contributed less to the class discussions. In addition, I wanted students to spend more time thinking about their contributions before exposing them to the class. The slow pace of on-line discussions allows this. Students can crystallize their ideas, expressing them in writing that they can inspect and evaluate before submitting it to group scrutiny. Being a shy person myself, who rarely contributed to class discussions as a student, I thought that I may be able to facilitate on-line discussions better than in-class discussions.

"Software Engineering" is a required, junior level course in the computer science curricula, with enrollments between fifteen and twenty. The majority of the students are traditional. By this time in the computer science program most students are employed in computer-related jobs. Nearly all of the classes in the computer science curricula are lecture and/or lab oriented, so the students have not experienced large amounts of classroom discussions. The computer science students are typically focused, technology-oriented individuals with little patience for open-ended questions. These students are working hard to become competent computer scientists and, unfortunately, many do not view computer ethics as part of the critical path to achieving their goals. (In fact, some see a highly developed ethical sense as a hindrance to success in a computer science career.) While most students want desperately to get a good grade in the class, they are not highly motivated to learn about computer ethics.

In teaching computer ethics in the past, I assigned readings and/or showed a case study on film. During a class period, questions were posed and discussed. Approximately ten fifty-minute class periods, broken into a day here and a day there, were devoted to computer ethics. In 1997/1998, I changed the pattern of holding traditional in-class discussions on computer ethics. Instead, I facilitated six email discussions, lasting from two to three weeks each. There were eighteen students in the first semester and sixteen students in the second. These students were broken into three groups. On the days when we held class discussions, the students did not attend class. Instead, they sent responses to questions, which I posed via email, to members of their group. For another week to ten days the students continued exchanging email messages within their groups, discussing the readings and my two to four questions. During the final week of the discussion each group developed a group answer to each of my questions. Each group had a discussion editor (this job rotated through the group) who composed and edited the group answer based on member input. By requiring a single group answer, and giving a single group grade, I hoped to increase interaction amongst group members. The groups were to work towards consensus, but could also report conflicting opinions. I was included on each group mailing list, so I was able to contribute to the discussion when I chose.

During the first two on-line discussions, I made deadlines, telling the students approximately when they needed to respond. This forced a degree of synchronicity to the class discussion -- that is, students made their contributions within a day or two of each other. I found this format too restrictive. After stating their opinion initially, some students found they had nothing more to add when the time came for a second contribution. These students simply restated their opinion. They continued to restate their opinions, ad. nauseum, until they had satisfied my submission criteria. In order to avoid repetitive contributions, I relaxed the response deadlines for the next two discussions. Students were told to respond, but they were not given a minimum number of required

contributions, and they were not given dates by which the responses had to be made. While this reduced the number of repetitive contributions, there was still little interaction between the students. I realized that the students needed to be taught how to discuss before they could engage in it. Each of the groups needed a facilitator. Rather than facilitate six discussion groups simultaneously, trying to keep their threads distinct in my own mind, I had the class form one large group. During these large group discussions, the students complained about the number of messages that they were receiving. However, due to my facilitation, the students were finally interacting in these discussions, and thereby, learning to think critically. Each day I read the contributions, and I responded on most days. As a facilitator, I encourage the students to elaborate their ideas, pointed out differences of opinions, and asked students to relate their ideas to those of other class members.

Advantages of on-line discussions

Overall, the students in this experiment thought more about computer ethics than did students in my previous classes. 63% of the students agreed that the on-line format was effective in encouraging them to think about the material. (However, a majority, 54%, responded negatively to the statement: "Classroom discussions can be effectively held in an on-line format.") One simple reason is that the students were involved with the material for a longer period of time. In-class discussions are, by their nature, short-lived. Each on-line discussion lasted two to three weeks. I enjoyed the way it wasn't necessary to cut things short at the end of every class period.

For the last two facilitated discussions, the contributions made by the students were insightful and informed. The on-line format encouraged students to be better prepared. Students seemed less willing to commit their ideas to writing before reading the material, than they were to contribute unformed ideas to an in-class discussion. It appeared that students consistently read the material and the contributions of the other group members before composing their own email messages. In order to commit their ideas to writing the students were forced to structure what they wanted to say. This required thinking about the material longer. In the final evaluation of the on-line discussions, one student commented that: "on-line discussions tend to be less of a discussion and more of a complete, well-structured document." Without aggressive facilitation the interactive aspect of the discussion was lost and the email exchange was reduce to presentations of mini-essays.

The on-line format made it easy to respond directly to comments made by other class members. Surprisingly, the students did not take full advantage of cut-and-paste, but did reply directly to messages if their response was to a single message. I spent a lot of time extracting excerpts from the messages in order to summarize our discussions. I found having the exact wording of comments helpful. As the moderator of the final two discussions, I found that the slow pace enabled me to better lead the on-line discussion than I could the live in-class discussion. One student commented: "It is easier to have a discussion on-line. It gives one time to think about their response."

I believe that forcing students to express their ideas in writing increased their writing ability. As expected, students submitted messages that contained spelling errors, wrong

word errors, run on sentences, etc. I did not attempt to correct student grammar, and did not notice any improvement in their writing skills. However, the students needed to write coherently in order to communicate their ideas. The messages being exchanged were not one-liners, easily understood with or without capitalization and punctuation. I suspect that with an increased reliance on email to communicate complex ideas, there will be an increased attention to grammar and, hence, an enhanced ability to express oneself in writing.

With the small number of students involved in this experiment, it is impossible to draw firm conclusions; however, it appears that shy students participated more in the on-line discussions. While the shy students did not typically become aggressive participants in the discussions, the on-line format guaranteed that their ideas were seen. Interestingly, the greatest proponent of the on-line discussions was a female foreign student. There continued to be non-participating members in the discussions; however, the on-line non-participating members were not the same people who were silent in the in-class discussions. The students who did not participate in the on-line discussions tended to be those who did not consistently make it to class. These students, if they were present during a class discussion, were frequently active, but unprepared, participants. Unprepared students were less likely to contribute to on-line discussions, and therefore, frequently received failing grades for the exercise.

Expected Advantages Which On-Line Discussions Did Not Deliver

When the students were divided into discussion groups my hopes were that the students would discuss the material and my questions, thereby gaining insights and accomplishing the learning goals set out for the class discussion. In this way, I imagined that a large class might be able to gain some of the advantages of a small class. This was not the case. Without facilitation, the students did not discuss. The students need prodding to elaborate on their opinions. They need encouragement to find common ground or contradictions with other students. One student was rather opaque about his unwillingness to discuss: "I have seen nothing in the contributions the rest of you have lodged to sway my opinion of what went on. Thus, I will simply reiterate my opinions…" Only with facilitation, as in the last two discussions, did the students interact. One student noticed this phenomenon, without attributing it to facilitation. He wrote: "On-line discussions were too mechanical at first. You would answer the questions and then you were done. Boring -- no interaction. But lately, the boat began to rock and liven up the discussion a little."
Breaking a large class into small discussion groups is an excellent idea. However, this experiment indicates that each group will need facilitation. This can be extremely time-consuming. Moreover, it is difficult for an instructor to keep track of the thread of multiple discussions that are all on the same topic. Thus, the most appropriate format for the email discussions in this experiment was for the entire class to be in the same discussion group as it was for the last two discussions. These discussions occurred in the second semester, when there were sixteen students in the class. While a live in-class discussion with sixteen students would have been manageable, sixteen was not

manageable for an on-line discussion. So many email messages were exchanged that the students found it difficult to keep up. I suspect that less than ten students would be doable via email. Any more than that is unwieldy.

One of the problems that I hoped to avoid with on-line discussions was the many silent students. I hoped that the on-line format would permit easily measured contribution levels. This was the case, but the quality of the responses was far from even. After the first two discussions I dropped the response deadlines and the class reverted to having several silent members. A new problem arose with the silent members. It was difficult to tell why the students were not contributing. Was the student shy, confused, bored, angry or simply not taking the time to log-on? Furthermore, it was difficult to engage non-participating students in the on-line format. A facilitator of an in-class discussion has several ways to bring a student into the discussion without actually calling on that student. For example, pointedly looking in that person's direction, catching the student's eye, physically moving closer to him or her. None of these techniques transferred to the on-line environment. One student wrote, "I think classroom discussions are better. You can't judge emotions and reactions though on-line discussions."

Conclusion

While this experiment shows that email can alleviate some of the problems of class discussions, it also shows that holding email discussions demands small class sizes, huge amounts of facilitation and a reduced ability to motivate students. A. Konstan and I. Molotsky in "A Closer Look At Distance Education" examine distance education from three perspectives: administrators, faculty and students. They report economies of scale as the major motivation of using information technology for administrators. (Konstan, pg. 112) Supporting this Massey and Zemsky report: "After a (sometimes large) front-end investment, the cost of usage per incremental student is apt to be low." (Massey) Since the tuition rates would remain the same, or increase, with distance education, some expect a net increase in revenue per student. This expectation seems unlikely, based on the experiment reported in this paper. Replacing the class discussion with the exchange of email increased costs, by requiring lower class sizes and increased facilitation.

This experiment also gives some credence to Plank and Edgerton's pessimistic concerns. In "Universities in the Digital Age" J. S. Brown and P. Dugid argue that students learn more from college than what faculty teach in lectures. "People leave college knowing not just things, but knowing people, and knowing not just academic facts, but knowing social strategies for dealing with the world. Reliable friendships and complex social strategies can't be delivered and aren't picked up through lectures, but they give an education much of its value." (Brown, pg. 13) Distance education appears to be effective for training people already in the work force, and possibly those students who are already part of a "community of practice" and are seeking advanced degrees. It is not effective for traditional students. Traditional students are eighteen to twenty-two years old. They have typically not held a full-time job for more than three months. These students need initiation into a "community of practice." They also need to be taught to think critically and to discuss.

Many decision makers have recognized that traditional students have different needs than non-traditional students. The cornerstone of the *University of Phoenix* educational philosophy is "the recognition of the distinction between the younger student still deciding on a career and the adult student who has established personal and professional goals." (University) The *University of Phoenix* claims to "have developed programs that allow mature students to benefit from the integration of work and school." (ibid.) When the *University of Phoenix* was founded in 1976, students were required to be at least twenty-three years olds and have earned 60 college credits. Today the age requirement of the *University of Phoenix* is still in place, but unfortunately students are entering the programs without any previous college experience. The *Western Governors University* plans to concentrate on two-year associate degrees and job-related skill certificates. Hopefully these programs will not target traditional students. Responsibility in what we offer via distance education, and whom we offer it to, is essential. This paper describes one experiment that shows teaching traditional students to think via exchanging email discussions is not cost effective. Bringing traditional students together on a college campus and exposing them to faculty in their chosen field is an effective way to give students the skills they need. These skills are not simply those needed to succeed in the job market, but those which create critically thinking citizens.

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