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Students' Distress with a Web-based Distance Education Course: An Ethnographic Study of Participants' Experiences

Noriko HARA ,SLIS Indiana University, Bloomington, USA
Rob KLING, SLIS Indiana University, Bloomington, USA

Introduction

Cutting-edge technology (e.g., digital communications and learning technologies) enables universities to implement distance education to reach more diverse populations and to provide more available learning environments 24 hours a day, 7 days a week. There are substantial discussions about distance education in higher education, and the number of asynchronous distance education courses that rely on Internet applications is growing rapidly .

There are at least five major kinds of literatures about asynchronous distance education courses that rely upon the Internet as a core communication medium: (a) a specialized research literature, which includes journals such as the Journal of Asynchronous Learning and the American Journal of Distance Education, research monographs, and specialized conferences; (b) a practitioner literature whose audience is administrators and faculty who may be involved in such courses (e.g., the Chronicle of Higher Education, written advice for instructors); (c) instructional materials for students taking specific courses (e.g., syllabi, orientation documents, tip sheets); (d) popular accounts of such courses written for the public (i.e., the mainstream press); and (e) marketing descriptions of courses and degree programs provided by educational institutions to their prospective students and their parents, employers and others.

Most of these diverse literatures, including the specialty research literature, emphasize the likely value of Internet-enabled distance education to institutions (for reaching new students and generating new revenues) and to students (for convenience, and possibly enriched educational experiences), although there is some debate about the actual costs (and thus profits) of these new distance education courses (Green, 1997). Amongst academic practitioners, there has also been considerable concern about whether universities or their faculty own the instructional materials that they develop for these courses (Noble, 1998). Some of the specialty research studies have examined the difficulties faced by instructors in developing and teaching these courses (Besser and Donahue, 1996; Rahm & Reed, 1998) or that students report in taking them (Wegerif, 1998; Rossman, 1999). Overall, though, the vast majority of the practitioner and popular articles about Internet-enabled distance education tends to emphasize the virtues of Internet-enabled distance education and to minimize the difficulties of routinely providing high quality courses or of students learning from them. This promotional bias has been characteristic of other practitioner and popular literatures about computerization (Kling, 1994). Further, many characterizations of Internet-enabled distance education deftly intertwine themes of (needed) educational reforms to improve accessability and a larger cultural narrative about "the death of distance" (Iacono and Kling, in press). Our intent in this study was to increase understanding of the process and students' actual experiences in an Internet-enabled course. However, as we will explore below, our study does focus on students' distresses in a particular distance education class. In this article, we use "distresses" as a general term to describe students' difficulties during the course, such as frustration, a feeling of isolation, anxiety, confusion, and panic. This focus has led to considerable interest in early versions of this article, as well as to some controversy.

Overview of Article's History and the Literatures of Distance Education

The article began as an ethnographic case study in 1997 of students' experiences in a specific course, with interviews and observations conducted and course-specific documentary data collected by the first author. One major aim of the study was to understand the experience of taking an asynchronous text-based, Internet-enabled course from the point of view of its student participants. It is difficult to find other such research studies. While students' perspectives are sometimes represented in the research literature, it is generally through course evaluation forms (Rossman, 1999) and concise characterizations of some students' comments or experiences. The course that we studied was chosen specifically because the instructor permitted observation of the on-line class and interviews with her and her students, thus allowing for the collection of more observational and ethnography data than has been previously reported. We had approached other faculty members to request permission to study their on-line courses in this way, but were denied. Availability of the in-depth data that we wanted was the only criteria for selection of the course used in this study. It was not chosen because we expected it to be either a particularly superb or troublesome course.

Some prior studies have cited the importance of students' isolation in distance education courses (Abrahamson, 1998; Besser and Donahue, 1996;Brown, 1996; Rahm and Reed, 1998; Twigg, 1997). The original research question for this study was: How and how well do the students in this course manage their feelings of isolation in a virtual classroom in order to create the sense of a community of learning? However, during the observations and interviews we learned that students' isolation was not a major problem, while students' recurrent experiences of other types of distress such as frustration, anxiety and confusion seemed to be pervasive. Possibly because of the small class size, the students supported each other and developed a sufficient sense of community.

Rather than speaking about feelings of isolation, during the first several interviews students frequently reported distress from various aspects of taking their course. We immediately investigated the research literature about on-line courses. A few studies mentioned students being frustrated with technical problems or anxious about communication norms (Dede, 1996; Feenberg, 1987), but their authors emphasized the value of the students' learning. Also, these previous studies did not provide detailed descriptions of on-line classrooms, nor did they indicate how these problems develop and are handled in specific teaching situations. We felt that the substantial distresses reported by our informants were not incidental and could actually impede their learning. Consequently we shifted our focus to examine the conditions that led these students to be distressed and some consequences of their distresses. In a subsequent section, we will illustrate these experiences, which are a byproduct of technical difficulties and communication breakdowns, as reported by our informants.

In the course of analyzing the field data in late 1998 and early 1999, we reviewed the literatures of Internet-enabled distance education more carefully to see whether and how others reported these phenomena. We found few explicit research reports, except for Wegerif's (1998) study which focused on the importance of developing a learning community.

We also searched the practitioner literature for articles and tip sheets that would help prospective instructors of Internet-enabled courses to avoid the kinds of difficulties that we observed in this one course. There is a reasonable literature written for instructors of face-to-face lecture classes and seminars. For example, McKeachie's (1999) well known Teaching Tips is now in its 10th Edition. In addition, we found some materials about the structuring and teaching of video-courses. We could not readily find similar quality materials for web-based courses. We were able to locate articles with general teaching tips (such as "emphasize interactivity," "provide prompt feedback"). But the handbooks to enhance face-to-face teaching often anchor their tips in specific research and flesh them out with a number of contextualized examples. In contrast, the articles with tips to

improve on-line teaching are rarely explicit about the basis for the advice and rarely provide a variety of contextualized examples of ways that students and instructors can concretize the advice. There is a huge discrepancy in the quality, quantity and accessibility of the materials that can help teachers improve face-to-face courses versus that which is available for teachers of on-line courses. This discrepancy leads us to suspect that the difficulties experienced by the instructor and students in this course might also be experienced by students in other web-based courses.

A report of our study was initially posted on-line as both a working paper and an extended abstract on a discussion list. We received mixed feedback from the on-line readers. Some of the e-mail messages were positive and indicated confirmation of our findings. Others, however, were more critical of the methodology employed. One suggested that the course was poorly designed and the instructor ill-prepared, and noted how "hard it is to be a good teacher." Another critic speculated that we might be trying to sabotage web-based distance education efforts, with the view that criticisms of Internet-enabled distance education were simply thin covers for faculty job-protection. We were quite surprised by the way in which our working paper had become so rapidly politicized within some of the debates about Internet-enabled distance education.

Publication of a story about our study in the New York Times On-line edition brought the study a new level of visibility. A one-paragraph summary circulated on several LISTSERVs and pointers to the story and our study seemed to be widely reposted. Our study attracted substantial attention, which brought us a hailstorm of new e-mail from researchers and educators, as well as from students who had taken distance education courses. In general, the researchers and practitioners in the field were sympathetic to the study's findings and indicated that they had had parallel experiences in their research observations or teaching. The students experiences varied -- some reported having difficulties similar to the experiences reported by the students in our study, while others reported having satisfying experiences with their on-line courses. We were intrigued by the extent to which some people simply wanted to tell us about good examples of on-line courses without helping us to better understand the processes, pedagogies, and backstage resources (broadly conceived) that influenced students' experiences in their on-line courses.

A few Information and Communication Technology (ICT) professionals claimed that the course, described below, was "designed to fail" from the start because of alleged limitations in the instructional design, student selection, or the instructor's preparation. For example, the instructor was a Ph.D. student. While she had taught before, this was her first on-line course. Implicit in some of these criticisms was the view that first- time instructors could be expected to have severe problems in teaching on-line. Even in 1999, we have been unable to locate readily available and widely appreciated guidelines that support this judgement. In 1997, when the course was taught, it is even less likely that such guidelines were available.

We know that issues of these kinds can weaken the performance of instructors in face-to-face courses. Yet, it is commonplace in North American universities for doctoral students or new regular faculty to teach their first course with "live students" and without much special orientation to teaching. Rather than making our study somehow marginal, these features stimulate broader questions about the kinds of people who are teaching the thousands of on-line courses that are taught each year in North America, their preparation and mentoring, and so on.

In short, this small-scale case study helps to raise interesting and important national-scale issues that merit serious engagement. The key issue is understanding how people work with their innovations in practice, without censoring that which is problematic. During the discussions and debates highlighted here, we expanded our focus from the course as a bounded set of interactions between an instructor and her students to also include the kinds of guidelines that would help the participants in working together efficiently. This article may help stimulate a better understanding

of the kinds of instructional design issues, instructor preparation, student selection practices, and communicative practices that should be widely encouraged.

Research Methods

Study Site

B3002 was a graduate course at a major university. It was an educational technology course in which students learn how to use information technologies in their areas of expertise. It was taught through a web site developed by graduate students who had worked with close faculty supervision during the previous summer. This site contained reading materials, activities, discussion questions, and additional readings organized along eight themes, such as authentic task, control, and "time and feedback." The course syllabus and assignment instructions were available on the web site. After students entered their usernames and passwords, they would see the menu screen. This page used the metaphor of a traditional classroom, so that the student could be situated in their familiar environments.

The Students and Instructor

In 1997, B3002 enrolled eight master's students; six of them completed the course. Four students had only minimal experience with computers, but one of them was quite enthusiastic about technology and spent thirty to forty hours a week for this course at the beginning of the semester. One student was very familiar with computers; she was also familiar with the course's content through friends who had taken B3002 during the prior summer. The sixth student trained teachers in integrating computers into a curriculum. She was living far from the university, and thus did not have direct access to university facilities. She was the only student who had taken a distance education course prior to B3002.

The instructor was a Ph.D. candidate. She was an experienced school teacher, but this was her first experience teaching in higher education and by distance education. She was selected, in part, because she was viewed as competent and sufficiently experienced by her department chair. She had taken B3002 in the summer of 1996, audited B3002 again over the previous summer, and participated in the design team for the B3002 web site. B3002 was designed by a faculty member in her program. The faculty member had provided content for most of the web site, such as course activities and reading assignments. The web site was used in a traditional class version of B3002 during the previous summer. However, the web site was not substantially altered for the online version of B3002. Instead, the instructor informed the students about the differences of some activities between these two version of courses by sending weekly e-mail messages.

Informed consent was obtained before each of our observations and interviews. Pseudonyms are used in order to protect informants' identities. We do not cite quotes from e-mail messages with their pseudonyms, as that could potentially reveal the students' identities to the instructor, who knew which student had said what in e-mail messages.

Data Collection

We used a case study methodology because we found it necessary to develop a "thick description" (Geertz, 1973) of a virtual classroom. The inquiry was an instrumental case study (Stake, 1995) based on a need for a general understanding of students' experiences in distance education. The department where this study was conducted offered several courses on-line. B3002 was chosen because the instructor permitted observation of the on-line class and interviews of her and her students. She was also interested in learning from this study. Six students, five at the university campus and one from out of state, were enrolled, and all agreed to participate in this study.

The empirical case study used three different methodologies: observation, interview, and document review. First, on-line classroom discussion was observed to examine the nature of students' discussion, the instructor's pedagogy (such as on-line discussion facilitation), the instructor's comments to students, and task assignments.

Various other kinds of observations were also conducted. One of the observations was a special event during the semester that provided opportunities for students to interact synchronously. They had a field trip to SchMOOze University—a virtual university campus accessed by telnet from all over the world. SchMOOze University is a MOO specifically designed for an English as a Second Language learner. (MOO is an acronym for "MUD Object Oriented" referring to "a multi-user, text-based virtual reality." . A MOO is programmed to provide an electronic space where people can meet on-line, have synchronous chat and discussion, and play games.) The rest of the observations were conducted in university computer labs. However, because we observed human-computer interaction, informants were asked to "think aloud" while they used a computer.

Second, we observed students' interaction with the course web site and conducted interviews immediately after the students had finished their tasks. Four of the six students in the course were observed for one to two hours. The interview following the observation lasted about an hour for each student. One student did not allow observation of his interaction with a computer because he anticipated discomfort with being observed during his coursework. Another student was living too far from the university location. However, these two students and the instructor agreed to be interviewed for about an hour (see Appendix for interview protocols). Moreover, data were collected from informal conversations with two students as well as the instructor.

Third, we examined various types of documents related to B3002, including the course syllabus, reading assignments, and the catalog's course description. The syllabus explained the materials that students would use, the purpose, format and philosophy of the course, the class schedule, and the requirements and evaluation methods, including readings and responses, electronic discussion forum participation, Internet address book, portfolios, and final project. In addition, with her permission, the instructor's personal reflection notes were reviewed.

Data Analysis

Observation, interview, and documentary data were analyzed simultaneously while data were being collected. This comparison of the information collected from various sources helped to verify the data, both within individuals (i.e., different data collected from a given informant supported each other) and between individuals (i.e., different informants tended to report similar issues) . Furthermore, each interview transcript and interpretation was validated by the informants. We also found some discrepancies among different kinds of data sources. In e-mail messages, some students expressed frustrations. However, they tend to balance their messages with positive comments. On the other hand, in interviews, some students balance their comments as in e-mail, but some students reported their extensive frustrations more than in their e-mail messages. In addition, observing the students while they were frustrated has strong effects on the observer. Therefore, we indicated a data source for each excerpt.

This article is organized as follows: the section "Students' Experiences in Distance Education" describes situations that students in B3002 encountered. The description includes minimal interpretation in order to provide a "vicarious experience" for readers, so that they can relate it to their existing knowledge and participate in a rich experience from this case. The next section, "Understanding Students' Perspectives," offers vignettes and interviews followed by a section of commentary. The "Discussion" section presents our conclusions from this study. Finally, the "Conclusion" section summarizes the study and raises cautions for the study of distance education. (Note that as the article's first author conducted the fieldwork for this study, in the text to follow

"I" or "me" refers to the first author, whereas "we" refers to both authors.)

Students' Distresses in an On-line Course

In this section we describe some of the situations that the students in B3002 found to be particularly troublesome. The students did not report that all of their course activities were distressing. However, the following examples illustrate the kinds of distressing events that stood out for the students.

A Virtual Field Trip

The students took a field trip to SchMOOze University to experience virtual space. When people join SchMOOze University electronically they see text-based screens, although this virtual university uses metaphors of location. People can explore different virtual buildings (e.g., library, Mall, and meeting rooms) to meet people from all over the world by using simple commands, such as "go to east." The following observation was a special event in the middle of the semester that provided an opportunity for the students to have synchronous interaction.

The class meeting time was set at 8:30 pm. All students and the instructor were supposed to meet at a virtual meeting room, so that the instructor could see who was on-line. I was observing one of the students, Kathy, for this field trip. Kathy immediately started the field trip to SchMOOze University when I arrived at her home by typing: @knock MMM (instructor's name) but the computer replied:

>I don't know

Kathy said, "It doesn't understand. How stupid it is. Let's try with a different name." Then she typed: @knock mmm two or three more times, but continued to receive the same response. She murmured, "I don't know what I am supposed to do. Maybe I am already in." At this point, several messages appeared on her computer screen.

Conversation on the screen proceeded very quickly, making it very difficult to follow. A student complained.

>Sheryl: Please slow down.

However, the conversation never slowed. When Kathy saw the following message:

>MMM: everybody seems familiar with commands.

Kathy typed: I practiced this afternoon. When she typed, Kathy seemed very careful about spelling and capitalization.

>Sheryl: I like the action of calling rows.

Kathy remarked, "I think what she means is 'calling role.' Sometimes it's confusing, the half of the students are non-native speakers." Kathy then saw the message:

>Julie: Julie is here

and tried to respond to it. While she was typing, she commented "By the time I type in my response, the conversation is gone." She typed: Welcome, intending this comment for Julie, but at this time several people who were not in the class joined the discussion.

The first 30 minutes went by very quickly while Kathy tried to identify who was there and what to

do. Kathy explained to me, "This is the first time we talked together." and complained, "What are we supposed to do?" and glanced at her watch. It was almost 9 p.m. and according to the instructor's guideline, students were supposed to leave the original meeting room, go to different buildings at SchMOOze University, and look for possible student activities. Therefore, Kathy typed: *Are we supposed to move around now?*

>MMM: chose building

When she saw the instructor's message, she murmured "I'm going to be out, go to lobby, and go to Mall." However, she couldn't find anybody to talk to at the Virtual Mall, so she maneuvered back to the original meeting room. She saw on the screen that there were still students from the B3002 class continuing discussions. She said, "Now, I'm back to the discussion." and typed: *Guess I need to stay put.*

>MMM: go to the building

Kathy said, " I feel like nobody is answering my question," and complained "I've already been around the campus and..."

While she was deciding what to do next, the on-line discussion at the meeting room was continuing. When she saw a message referring to Ann, she typed: *Who's Ann?* The situation was chaotic in the room because different simultaneous conversations were overlapping (Herring, 1999). Before identifying Ann, Kathy said, "Maybe I'll explore the campus now." She suggested going to a virtual bar to her classmates by typing: *How about the bar?*, and saw everyone's agreement with her suggestion. When Kathy saw a message saying

>Knock, knock

she suspected that somebody had knocked at her door. She responded by typing: *Enter*, but received no answer. Kathy muttered, "What am I supposed to do? I'm confused," and looked at the instructor's guide. Prior to this event, the instructor had sent out the instruction for the SchMOOze University field trip and a map of the SchMOOze University through e-mail. Kathy assumed Julie was sending a message that knocks at her door because she saw Julie's message asking her a question, and thus she tried to find where Julie was. Kathy then moved to where Julie was and Julie sent a message to her.

>Julie: I don't want to leave you at the bar alone.

Kathy laughed when she read the message. Julie tried to instruct her how to respond to a knock in this text-based environment, but Kathy was still struggling. Kathy looked at her watch and said, "This is exactly an hour." She told me, "If I have one complaint about this class, it is that time goes so quickly. I can be hooked up with a computer for a whole day and then realize that I haven't had a dinner or I haven't prepared my lesson plans."

Although Kathy had tried to be well prepared for this special event, the virtual field trip, she had nevertheless experienced many difficulties during it. She had tried going to the SchMooze site earlier in the day to become familiar with it, but at that time no one had responded to her attempts at conversation. Thus, the class field trip was the first time that she had experienced the fast pace of this kind of communication, and she had found it overwhelming. She had also been frustrated at the field trip because she could not figure out what to do when she could not operate her intended commands, e.g., simply responding to a knock. There was no one to ask for help, so she had to attempt to resolve the difficulties by herself.

Amy commented about this virtual field trip at a computer lab a few days after this event:

> ***At SchMOOze University, [when I planned to meet with the classmates,] I got lost. Before this event, I had to set up software, some special software for MOO the instructor said, on a computer. So, I downloaded it and set it up. I checked if I could go to the meeting room before the class activity time, then I went there successfully and thought everything was fine. But, when I went there to see classmates at the meeting time, I got lost. I could see their on-line conversation, but they couldn't see my messages. So, I called Sheryl and she taught me how to use commands and so on. I just forgot to put parentheses when I typed. That's why the classmates could not see my messages. I talked to other people from different places at SchMOOze University, but not my classmates. I was so frustrated because everyone else could do it, but why not me? Not only for the SchMOOze University activity, but I put in lots of time for this course overall, but I couldn't see the results. Like I paid a hundred dollars, but I only got ten dollars back. I probably spend a hundred minutes, but I can get ten dollars worth (personal communication, November 11).***

Like Kathy, Amy was frustrated because of the problem that she had with operational commands at SchMOOze University. She expressed her frustration and even anger at herself. She felt as if she had been left out of the class because she could not use the commands properly.

Julie also had had a distressing experience with this virtual trip. Because of the slow connection from her computer, her responses were significantly delayed. When I observed Kathy trying to talk to Julie on-line, Kathy had no response from Julie for more than 2 minutes. Finally, Kathy discontinued her conversation with Julie. Another student also reflected on the trip in a personal e-mail to the instructor the next day after the field trip to SchMOOze University:

> ***I thought your [the instructor's] preparation for our visit to SchMOOze U was excellent. ... I did not enjoy our class excursion there however because the technology did not live up to expectations. I also felt more encumbered by knowing people there. I was more cognizant of hurt feelings and other people's frustration, it narrowed my exploration (personal communication, October, 23).***

There were, however, some positive comments about the virtual field trip. John seemed to be excited about the new technology he was experiencing, and was generally enthusiastic about the SchMOOze University activity, despite encountering some negative aspects.

> ***I'd loved the MOO session. I felt like doing that, we're really sort of like a community. I was totally laughing, at my computer, laughing. It's so weird to laugh at the computer. But I was laughing because I really felt somebody's there talking. And I met a person that was kind of cold to me and asked me weird questions, and they never really answered my questions. That hurt, you know? So it's real feelings that were involved. It's kind of interesting (personal communication, October, 30).***

Working Alone at Night

It is common for students in many on-line courses to work alone, often at home in the evenings or weekends. However, it is hard for students who work under these conditions to resolve some of the kinds of potentially frustrating problems that can typically be discussed and resolved more readily in a face-to-face class meeting.

The dynamics of this issue are illustrated by the experiences of one student, John, whom I met

unexpectedly when he was working alone after midnight in a campus computer lab. The week's topic was "feedback and time." John was working on an assignment which required him to evaluate a set of lesson plans that used information technologies in education. These lesson plans were developed by instructors elsewhere. The web design team of B3002 had located a number of lesson plans available on the Internet and linked to them. John started talking:

> **J: I am frustrated because I am here too long (laugh).**
>
> **I: How long have you been here?**
>
> **J: Ohhhhh, I...probably nine o'clock, I guess.**
>
> **I: Four hours?**
>
> **J: Yeah. So, my eyes are tired. Of course, a part of the problem is not totally the class's fault. Part of the problem is finding things really interesting. They don't completely relate to the class. I mean, we are looking for things, lesson plans that we have to evaluate, right? And there are all kinds of great lesson plans. I am looking for ideas for my classes and I just get stuck. Then by the time I'm at the place where I really need to be doing my work, I'm totally frustrated because I really want to go home. I don't want to be here anymore...**
>
> **I: Too much information?**
> **J: Perhaps. I mean these links on the B3002 web site have all the lesson plans that we can give to a class. I think this one [pointing to a link], just tons and tons of activities, but most of the stuff on these, I don't like.**

John went on to explain that he was frustrated with the poor quality of many of the lesson plans that he had found for his assignment.

> ***J: It could be better if I could make my own lesson plan or something and then, talk about how I would use assessment in it. So, anyway, I've got a couple of things I want to use for the B3002 class assignment, but I feel like it's sub-standard. Or not exactly how I would want to define it if I would be looking for something to fulfill the requirement (personal communication, November 11).***

John reported significant distress during this interview. He still had not received specifications for the assignments from the instructor and was confused about her expectations.

When I left the computer lab, John returned to work on his assignment and declared, "I will finish this work anyway. It'll probably take an hour and it may not be a good work. ... But just do it." It was almost 1:20 am. He said in a tired voice, "You have a good night, and I'll have a good night."

Interactive Communication Tool: E-mail

The students and instructor relied upon e-mail as a primary means of communication. In fact, the instructor required that students post e-mail to the class discussion forum "at least 5 times during the course." Her syllabus also noted: "Participants are expected to check the list daily."

The students and the instructor in B3002 generated quite intensive on-line discussions through e-mail, and all of the students posted far more than 5 one-to-two page-long messages. During the

week of October 19th they posted 35 messages; this volume was common throughout the semester. On the surface, this volume of discussion indicates a lively class. However, we found that there were some underlying problems with the reliance on e-mail.

First some students did not read other people's postings before writing their own e-mail messages. One student reported this practice in an interview. Second, some students were unable to make time to read and post e-mail during short intensive discussion periods. For example, one student did not post any comments when the other students intensively discussed a particular topic for two days in the middle of the semester. After another student summarized the overall discussion in his e-mail, she sent an e-mail that had a subject line saying, "Ah ... I cannot catch up with all of you : (." She was one of the students who posted the fewest number of e-mail messages to the on-line class discussion. Some other students also reported that they were overwhelmed by the volume of e-mail, and that they fell behind in reading and responding on-line. Some of the students' difficulties were a byproduct of using e-mail differently than the more conventional way. In the "standard view," students will read their e-mail on-line and reply immediately from their computers. My observations of Amy, who did not have a computer printer at home, revealed a more complex way of working with e-mail.

Amy logged into a computer system in a campus lab and copied all of her e-mail messages into a word-processing file. She reported that she didn't want to waste paper, and that although it took time to copy the messages, if she printed messages directly from the e-mail system it would look like a lot more to read. "After that, I delete the messages because it's too much e-mail." She reported that her routine for B3002 was to print out all the e-mail messages for B3002 in a word-processing document, print out all the readings for this course and then read the e-mail and reading assignments at home. She would reply to messages on another day when she returned to the campus computer lab

.
Another student, Eric, also commented about the overwhelming e-mail messages:

> ***I don't like, I have to say, I don't really like turning on the computer and finding that I have eleven messages on my e-mail. It's a pain. I mean to answer that many things, just talking in conversation would be so much easier, rather than replying and doing all the stuff you have to do. So, that is just time-consuming, but it is a part of at a distance. I think if you are doing that, you have to be aware that you're gonna be spending more time with computer problems, not getting on-line, software freaking out, crashing, whatever it's gonna happen, it gonna take you a lot longer, waiting in a line at a lab. There are so many things that make it kind of difficult to do (personal communication, November 13).***

It appeared that students in B3002 were competing with each other, or felt obligated to produce a notable number of thoughtful and detailed e-mail messages. The category "e-mail messages" consolidates diverse communications: short conversational notes and more elaborate multi-screen memos. These were mixed into the students' other more general e-mail flow, such as messages from co-workers, others students, friends, and administrative announcements.

The research literature indicates this complication of asynchronous computer-mediated communication (CMC). Wegerif (1998) also reports a student's comment of a "daunting prospect" of being behind reading messages. While the advantage of CMC is that it reduces the constraints of time and location (Ahern and Repman 1994; Burge, 1994; Harasim, 1990; McIsaac and Gunawardena 1996), it is also very demanding for students and instructors to read all their messages (Hara, Bonk and Angeli, 2000; Hiltz 1998; Kang 1988; Wiesenberg and Hutton 1995). The

instructor also commented that at the beginning of the semester she was spending all day doing nothing but reading and responding to e-mail messages. Later in the semester, she was able to reduce her workload, but still spent a large amount of time on this course.

Understanding Students' Perspectives

Complexities of Working Alone

Much of the distance education literature emphasizes the convenience of this educational medium. In practice, this convenience translates to students working at different times and in different locations. While often valued, this also leads to certain stresses. For example, in a web-based distance education course, students do not see each other or their instructors unless they use a video-link (Besser, 1996). B3002 had no video support and the absence of physical cues led to some confusion and anxiety for the students. John was working on one of the B3002 activities in a computer lab and reading e-mail messages. He pointed out an e-mail message from the instructor and said:

> ***I agree with her, but I am not sure if I should send a message saying, "I agree." That's the problem with this e-mail. If this is the classroom, you can just nod your head to show your agreement. I am not always sure that if I am contributing enough or not. Other people, like Julie and Kathy, are really active. I feel a sense of competitiveness. So, my survival skill is not to respond. In fact, I haven't gotten any feedback about my contribution. I cannot tell from the e-mail. You can tell from the classroom what the professor thinks about you from the body language and the way they talk. So, I am not feeling that I'm getting enough assessment. I haven't gotten any grade for this class, but most of the grade is from the portfolio, so it's OK, I guess (personal communication, October 30).***

Eric also indicated his frustration with not getting enough feedback:

> ***One of the problems is that I'd like to have feedback. A kind of constant feedback. With the class, you don't really,...especially this distance ed., I guess you don't get that kind of feedback (personal communication, November 13).***

Sheryl expressed her frustration with the lack of immediate assistance from the instructor as well as the difficulty of finding information on the Internet. While working on an assignment for the B3002 course, Sheryl had gone to the Yahoo Education site, and typed as a keyword *instructions for evaluating electronic learning.* The computer responded:

>There is no web site to match your inquiry.

She looked unhappy. (It is likely that she had used too specific a phrase rather than a careful selection of keywords. It would have been helpful if one of the class sessions taught tips and techniques for searching the web.) Sheryl next went to the AltaVista search engine web site, where she could also search for web sites by entering keywords. She explained, "One of my friends told me that Alta Vista is much better." Alta Vista helped her to locate one web site, but that page didn't help her. She did another search with the keywords educational assessment. This produced too many matching pages, so she tried to narrow down her inquiry, by adding "assessments" and "education." This seemed to produce a more reasonable list of the sites for her topic, and Sheryl printed out two pages for her assignment. While she was assessing the web sites, she also read the e-mail instruction from the teacher again to make sure she was on the right track; she carried a 3-inch-thick folder that contained all the e-mail messages for this course. Sheryl next went to the

web site that was referred to in the e-mail instruction, but she did not find relevant readings on this site.

She clicked the Net Search button on the Netscape menu and went to yet another search engine, InfoSeek. She explained, "I am not satisfied with these articles that I found so far, so I'm doing more research." She typed *educational instruction and assessment*. The list of web sites did not satisfy her. Next, she typed *classroom instruction*. She glanced over the list, but it did not match her requirements. Then, she tried *instruction for on-line language learning*, which brought up a new list. At this point it seemed that she had found a reference that was quite promising, as its title was the same as that of the class. However, when she tried the links on that page, none of them were working. She could not reach any web sites and was not able to find the sites she was looking for. She felt that "this part is most frustrating -- finding the information from the web." She compared her experiences to what she had heard about the other B3002 class that had been taught over the summer, saying, "they had more resources. They saw a teacher in person, so they might have had the same problem, but not as much frustration as this."

Commentary In contrast to his positive comments on the virtual fieldtrip, John seemed to be unsure about the communication conventions appropriate for participating in the on-line class. It appears that some of his anxiety was caused by a lack of feedback from the instructor. Not being able to see his instructor physically and determine the instructor's expectations was likely increasing his anxiety level. Eric had indicated the same problem. These anxieties and communicative confusions that are a byproduct of limited social cues such as gestures and facial expressions have been identified in the research literature (Kuehn , Harasim , and McIsaac and Gunawardena). Feenberg (1987) refers to these experiences as "communication anxiety."

Sheryl expressed frustration that came from a poor understanding of effective web searching and a lack of immediate help. One gap in the 1997 version of B3002 may be the (tacit) assumption that graduate students in this program all had good on-line search skills. (The face-to-face version of B3002 included interns who could consult with students at their PC's when they had technical problems.)

The lack of prompt feedback from the instructor was certainly a major source of anxiety and frustration for students because they were concerned about their performance. , "the concept of interaction [including feedback] is fundamental to the effectiveness of distance education programs as well as traditional ones" (p. 407). Bonk and Cummings also suggest the significance of feedback in web courses. In B3002, the instructor did realize later in the semester that she needed to give more feedback to her students. In her weekly announcement on November 10, 1997, she apologized for not providing "enough and prompt feedback."

Technological Problems

During the interviews, some students reported frustration with technological problems and the absence of personnel to provide technical support. Unlike the other students, the following informant was taking the course from a distant site. She indicated three areas of frustration, the biggest of which were with the technology and the inflexibility of the course schedule.

> ***First of all, inappropriate prerequisite statement. For example, there is nothing to say that you should know HTML, but our first assignment was creating a web site. Fortunately, I knew it. I'd explored learning how to do HTML by myself. If I didn't know, I just cannot imagine how to get through. Secondly, this course is very time specific. The course I took before, I could go in anytime and finish anytime. However, this course is very specific in terms of time. For example, I got into the class a week***

late and the instructor sent me e-mail saying that they had already started. As an old learner, I felt so intimidated. I felt pressure to catch up. Third, accessibility to technology. This is related to the prerequisite. There is nothing that says we should have access to a web server. However, when we developed the web site as an assignment, we had to have the server access. Since I work for a school, one of the technical people helped me to connect to the web server. If I didn't have these resources here, I would have dropped this course.

I don't have any access to the wonderful computer labs in the university. I don't have a [electronic] student locker and software that are available on campus (personal communication, October, 31).

In addition to observations and interviews, students' on-line discussions via e-mail gave us insights into what was happening during the class. Reading students' e-mail served as another substitute for physical classroom observation. Some students expressed their anxieties and frustrations with the course in their messages. For example, on a Friday evening a student wrote the following message to the instructor regarding a technical problem:

I have spent one hour trying to follow your directions. I am getting an error message. The first time I tried to download it as a zip file, the error says, cannot access this file. I am getting extremely frustrated : (

On Saturday afternoon she wrote another e-mail message regarding the same issue:

This computer is very frustrating. I would imagine it is like sitting in a class and only understanding some of what was said, then asked to answer a question. I have felt it... panic... isolation... frustration... anger. This has been a very good lesson. I will keep trying.

About 30 minutes after this message, the student sent an e-mail message saying that she had solved the problem.

The instructor's personal reflection notes offered a different perspective, and helped us better understand the class dynamics. The instructor expressed her problems and frustrations with not being able to solve students' technical problems. For example, in one of her personal reflection notes, she wrote:

I may need to understand more about how network and ISPs [Internet Service Providers] work. This to me is a hardware issue that I really did not want to touch and that I don't know how much help I could give to people. But, Julie and the previous two real distance students (who dropped out after several frustrated experiences) keep pushing me to this knowledge domain (personal communication, October 18).

Because of their e-mail interactions, the instructor knew that students had difficulty dealing with technological problems and felt frustrated. During the interview, she commented:

I think computer skill-wise, they [the students in B3002] are not able to handle some

> ***of the assignments and exercises. And ordering, like we started from building web pages with very minimum help, even though we provided them with very good, we thought, very good job-aids, but still they had difficulties. Help themselves learn. They are not in that kind of mode yet. They still need help. I guess both them and us, we are not used to this kind of environment at all. If you are in a classroom, a teacher can lead them during the process, so whenever they have problems, we can just fix it, right on a spot. However, if you give them the job-aids, if there is anything wrong there, there is no way we know. There is no way we can fix it right away and make it smooth for them. So that's frustrating for them and also frustrating to me because sometimes you feel that you've done everything you could, but just it doesn't work out that way (personal communication, November 18).***

Commentary

The student without direct access to technological hardware and support had to resolve technological problems that the other students did not experience. She was the only student who did not live near the university, and her technical environment was different from that of the other students. She was as concerned about the technology as she was about the course content because her technical support was inadequate. However, some of the other students also reported difficulties with technology during observations and interviews.

Several research studies (e.g. Burge, 1994; Gregor and Cuskelly 1994; Kang, 1988; Wiesenberg and Hutton 1995, November; Yakimovicz and Murphy 1995) report students' frustration with technology during the evaluation of their distance education courses, but they do not thoroughly investigate it. However, the importance of computing support for professional work and even the public's use of the Internet has been well reported in other research studies (see Kling and Jewett 1991; Kling 1999).

Pedagogical Issue—Ambiguous Instructions

Much of human communication is inherently ambiguous. But people can often adequately resolve key ambiguities when they are face to face. When the primary communication medium is written text, resolving ambiguities may be more difficult for many people, as is indicated in the following interview excerpt:

> ***Though I understand each sentence and word in the e-mail that the instructor sent us, I don't know how to use the instructions to compose the programming. Because in her instruction, sometimes I can follow steps 1 and 2, and then I can't follow from steps 2 to 3. So I go back to the beginning and start over. The instruction is all in text, no graphics because she sends it to us through e-mail. ... So, when I submit my assignment, I always put a note to her, "please let me know if I need to do more or if I need to delete something" to make sure if I do the things that I am supposed to do. Because I don't know exactly what the instructor wants. (Amy, personal communication, November 11).***

In this interview, Amy identified two recurrent sources of communicative ambiguity. She had trouble adequately interpreting both the instructor's weekly e-mailed instructions as well as the instructions on the B3002 web site. In our documentary analysis, we concurred that many of these instructions were under-specified and ambiguous. For instance, one of the activity instructions on the web site was:

- **Review the sample testware package that you have. What does it test? How do you think it facilitates learning? OR Visit one of these sites: [List of URLs]**

- **Look at at least two electronic portfolios (student works) in Student Project page [URL]. How would you give feedback to the student?**
  OR
- **To create a quiz on the Web, here are some tools you can use: [List of URLs]**

The instructor's intent was to give the students flexibility. However, some students did not consider this flexibility to be an advantage, and they wanted more structure and clearer direction. Sheryl, for example, did not think that she was getting effective instruction because of the ambiguous instructions on the web site and in e-mail messages from the instructor.

> ***I: What's the biggest problem in this course?***
>
> ***S: I think the biggest problem is the instruction of our assignments. I usually don't understand what she wants, either e-mail or from the web site. Actually I shared the print-outs with my friend. He is a doctoral student, and he looked at the instructions. He thought that our instructor was not a very good presenter because he also agreed that those instructions were so ambiguous that it's very confusing. There were no points at all. Sometimes, she takes all kinds of responses and she would say, "it's good you are creative," but sometimes I got her response that this is not what I want. So I felt very frustrated because we were supposed to be creative and that's what I came up with, but she said that's not what she wanted. That's the biggest problem (personal communication, November 5).***

Sheryl went on to relate her dissatisfaction with the amount of content provided by the course, particularly that of theoretical orientation to the material. Unlike the other students in the class, Sheryl had no prior background in the subject area. Given the class' lack of clear instructions, background information, or even explicit definitions of terms, she found herself having to attempt to glean this information from the general class discussions, and felt that she had only gained a general sense of the material.

Like Amy, Sheryl also gave up trying to clarify the instructor's expectations after asking her a few questions. When I asked her what was the most frustrating thing, Sheryl answered:

> ***lack of teacher's support and teacher's clarification of her instruction. Usually I e-mail her if I have any questions and her answer is very ambiguous, too. So, I won't ask the second time (personal communication, November 5).***

Kathy's frustration was that she was uncertain what the instructor expected for this course because she could not see the instructor physically. She also gave an example of how she misinterpreted the instructor's message in an e-mail message.

> ***The instructor has been good about responding immediately when you ask something. However, I have been in school in my life and I didn't realize how much I relied on my knowledge of what teachers are looking for, sort of, you know. You sit in a classroom with somebody and you analyze who they are and what they like and you cannot analyze because you've never seen them. So, you are only guessing at what teacher really wants.***

> ***You don't know how to interpret what they say because you don't know the personality. Like one time, the teacher was joking and I took her seriously and it really hurt. She was saying that, I can't remember what it was now, but something about that nobody is working ... since none of you are working at this, maybe we should do such and such and I wrote her back, "what do you mean we are not working. I am spending 6 hours a day" and she wrote back that said, "it was only a joke." So, things like that, but I think if you are, like, very careful in what you write and communicate often with people, you can put them easily to get to know you (personal communication, October 22).***

Both the students and the instructor reported periodic distress with this course. *Even so, during interviews, the students complimented the instructor's overall performance*. They appreciated her support and some students even sympathized with her because she also had to resolve many technological problems.

The distance education format amplified the difficulty of interpreting the students' messages. The instructor reported that she received periodic e-mail about ambiguous expectations in this course.

> ***"Sometimes they do give me some of this [complaints of ambiguous instructions], right, but you know sometimes you don't really know whether it is just an excuse or it is real. You don't know."***

Commentary Reading the assignment instructions for B3002 on the web site provided opportunities to verify informants' concerns. First, the students often wanted less ambiguous instructions than were provided on the web site. In face-to-face courses, the students could ask converse with the instructor and each other to reduce major ambiguities during the class meetings. In contrast, the asynchronous "anywhere-anytime" format of B3002 often lead to significant delays between the times that students raised questions and the times that the instructor could reasonably answer them. Second, this web site was developed for the same course offered in summer, and the summer course was offered in a traditional classroom, rather than the web-based distance education form. Some of the instructions taken from the summer course did not fit the distance version of B3002. For example, one of the activities instructed students to form teams. However, in the web-based distance education course, students had to work individually, so the instructions confused them. Third, this web site had been developed before the course had started, and some links to other web sites were no longer accessible.

The students reported confusion in effectively understanding the instructor's expectations. The instructor knew that the instructions on the web were too ambiguous, and she attempted to clarify them. For the final project, she sent out an e-mail message:

> ***"I think we need a set of very clear criteria so that you and I know exactly what you are expected to do and how your project will be 'judged'." (personal communication, November 10).***

However, this attempt did not succeed. A few students posted questions about her "clear criteria." Overall, not all the students in B3002 were familiar with the technology used in the course and some were feeling rather overwhelmed. Therefore, the unclear instructions and expectations for B3002 likely amplified their anxiety.

Dealing With Distresses

Amy dealt with her distresses with B3002 by talking with a classmate of similar ethnicity in her own native language. Amy stopped communicating with the instructor about her difficulties after one unsatisfying interchange with the instructor. Thereafter, Amy complained only to her friend.

> ***A: I am calling a friend every week, just to complain. She is a good listener, whenever I complained, she just listened and I felt better.***
>
> ***I: Did you complain to your instructor?***
>
> ***A: Once.***
>
> ***I: Why just once?***
>
> ***A: I complained once about the difficulty of searching on the web, and she gave me the tips for searching as I told you before. After that, I didn't complain because I felt stupid. I should have spent more time on this, but I couldn't because I'm too busy. If I hadn't taken this many courses and also work, I could … if you want to take this course, you have to spend time. I want to complain, but it's not the instructor's problem, or the class's fault. It's my problem. There is nothing she can do about it (personal communication, November 11).***

Despite his periodic frustrations, John expressed a different view in an informal conversation. He believed that his frustrations were a good learning experience because now he understood what his students might experience when he teaches similar courses in the future.

B3002's instructor did try to help her students resolve their difficulties. Later in the semester, she started to ask students for their suggestions to improve tutorials and teaching materials. She believed that at this point the students felt less frustrated. In one of her messages to the students she wrote:

> ***I'm more comfortable to let you face flaws now than before, because I feel that: (1) You have experience solving this level of computer problems. (2) You know that learning can come from failure and frustrations. (3) The communication channel that we happen to so luckily have helped too (personal communication, November, 1).***

Also, she stated the same issue in her personal reflection notes:

> ***It was from the MOO week that I started asking them for improvement ideas, and it seems to me that this opened a new door for communication. … All of a sudden they agreed that it is all right to be frustrated when following instructions that are with flaws, because flaws give opportunities to think and to gain real control (personal communication, November 1).***

Commentary If students could deal effectively with their frustrations, B3002 might not be a negative experience. In fact, the students supported each other by sharing their frustrations with their friends or with their classmates. We also suspect that without this mutual support, none of the students would have completed this course. Some students felt a community of learning with their classmates. The instructor also helped create a sense of community among the students. Bates (1994) claims that one of the major contribution of two-way technologies is allowing

interactions among students as well as between students and instructors, and there was some active interaction among students in this course. Many researchers note the importance of virtual community to support students (e.g., Burge 1994; Jonassen, Davidson, Collins, Campbell and Haag 1995; McIsaac and Gunawardena 1996; Savard, Mitchell, Abrami and Corso 1995). In this case study, however, it seemed that students' distresses -- confusion, anxiety and frustration -- recurred throughout the term.

Conclusions

Instructors' Misperceptions of Students' Distress

From the interviews and observations we found two foci of students' distress in this course. The first focus was technological problems, and students without access to technical support were especially frustrated. The second focus involved the course content and the instructor's practices in managing her communications with her students. Students reported confusion, anxiety and frustration when they wanted prompt feedback from the instructor and when they found ambiguous instructions on the web and in e-mail messages.

The instructor did not appreciate the duration of the students' distress. She believed that she had effectively eliminated their anxieties and frustrations during the term and noted during an interview:

> ***They [the students] thought that the problems they had were basically their own; other people did not have the same problem until we opened up the conversation and they realized that, oh, yeah, we were all in the same boat. Now, they have this peer support coming in. That [problem], I think, we took care of pretty well (personal communication, November 18).***

However, her students still expressed their frustrations and anxieties during observations and interviews late in the semester. Part of the reason for the instructor's misperception resulted from the students reluctance to express all of their anxieties, frustrations and confusions to the instructor. Because of the frequent power differential between students and instructors in university courses, it is likely that these students did not feel free to express the full extent of their dissatisfactions, or the extent to which their expectations were not met. We suspect that these difficulties were exacerbated by the weaker social cues of asynchronous text-based communication. After all, small elective graduate courses are often highly rated, in part because instructors can better appreciate their students experiences and preferences than in larger courses; and because they have greater latitude in flexible adaptation during the term.

The Pains of Innovation

We caution against emphasizing only the virtues of computer-mediated distance education. Most of the articles about distance education that are written for practitioners (i.e., administrators and teachers), and lay people (e.g., potential students) emphasize the positive opportunities presented in distance education (e.g., Barnard 1997; Harasim 1993; Yakimovicz and Murphy 1995).

In some of these upbeat studies, students may not have had opportunities to express their confusions and anxieties with web-based distance education. At the end of the semester, students might make positive comments about the courses because of a relief of finishing a course and concern about hurting instructors' feelings. For example, one B3002 student posted a "thank you" note during the final week saying how much she had learned, and how much she appreciated these learning opportunities:

> ***I do believe you all are the best classmates and instructor I have ever met. I can see your hard work, your enthusiasm, and your patience learning along. I'd like to say that the most successful condition I've learned from this class is: warm and supportive class atmosphere (personal communication, December 1).***

If students give public evaluations like this in courses like B3002, the positive results of many studies, including such findings as students enjoying their experiences despite communication breakdowns and technical problems, can be artifacts of the research methods (Gregor and Cuskelly 1994; Yakimovicz and Murphy 1995). Unfortunately, only a few scholars (e.g., Bromley and Apple 1998; Feenberg, 1999; Jaffee, 1998; Wegerif, 1998) examine important limitations and pervasive problems, and their studies are found in the specialty research literature rather than integrated into the practitioners' literatures.

As noted earlier, we found some discrepancies among the different data sources: observations, interviews, and e-mail messages. Triangulating various kinds of data sources enabled us to see distance education course from a different perspective. We recommend that future researchers use this kind of multi-source methodology to study distance education courses.

Understanding Instructional Work and Communication in Practice

It is time to seriously examine the actual experiences for students in distance education courses and to critically discuss the wide array of practices and experiences that undergird distance education. It is easy to place the burden of students' frustrations wholly upon the instructor's limitations. One might argue that this course was a unique case of an insufficiently experienced instructor poorly teaching an on-line course, and that this "oddball case" tells us nothing about on-line courses in general. We disagree with this interpretation.

Everyone who teaches an on-line course has to start with their first on-line course. We have not found any widely publicized articles that encourage faculty who are starting to teach an on-line course to prepare in special ways. In this era when the number of on-line course offerings is growing rapidly, it is likely that a notable fraction of these offerings are taught by "first-time instructors."

The students' concerns about receiving "prompt unambiguous feedback" continued throughout the term. We believe that "prompt unambiguous feedback" is much more difficult in text-based asynchronous courses than in face-to-face conditions. In passing, we noted that many of the students worked on the course during the late evenings and weekends. "Instant feedback" would require the instructor to be available at these hours, thus turning an "anytime convenience" into an "all the time" workload! This issue could be even more significant in larger classes. What is needed is for the students and instructors to learn how to manage their expectations about when they should be able to have reliable, fast communicative responses.

We have also commented upon the communicative complexity of constructing adequately unambiguous conversations via text-based media. Part of the complexity comes from trying to anticipate the level of detail and phrasing that will be sufficiently helpful to others. But, as our informants also noted, they were also unsure what meta-communicative conventions would be appropriate in their on-line conversations. E-mail that represents the nodded heads of a face-to-face group could be valued by an instructor to confirm others' understanding, or it could result in yet more e-mail glut. These kinds of practices need to be negotiated within each group. In B3002 and doubtless in many other courses, both face to face as well as on-line, participants don't explicitly question and negotiate meta-communicative conventions, even when they are confused and frustrated. These discussions and negotiations require a higher level of social skills on the part

of all participants. And their enactment – such as creating strong social presence in a written medium – also requires time and expressive capabilities which are not well explained in the literatures of on-line instruction. Clearly, we need more student-centered studies of distance education that are designed to teach us how the appropriate use of technology and pedagogy could make distance education more beneficial for more students. In addition, we need ways to translate the best of such research into the practitioner literature.

There is, of course, broad public appeal for the hope of inexpensive and convenient education, especially for people who are working or who have extensive family commitments. Unfortunately, little of the practitioner literature and even less of the popular literature about distance education (in any of its modes) effectively identifies the complexities of working and communicating with "new media." It is not impossible to locate such accounts, but they are published in specialty journals such as Instructional Science (Feenberg, 1987) and Semiotica (Feenberg, 1989) which remove them from ready availability to the diverse faculty and administrators who are involved with teaching on-line courses.

It appears that few academic administrators, especially those at one or more levels away from the front-lines of teaching, understand these complexities very well. Rather, administrators who want to encourage their faculties to teach on-line courses coax instructors into viewing on-line courses as easy to take on rather than as a complex instructional engagement that can require new materials and new behaviors. High quality education, both on-line and face-to-face, is neither cheap nor easy. We have not heard of administrators in traditional universities who encourage regular faculty to teach on-line courses also insisting that these instructors immerse themselves in the most sophisticated literatures about distance education and computer-mediated communication before they are allowed to teach on-line.

We understand that there are many high quality on-line courses taught today. However, a careful reading of the literatures suggests that they are usually taught by highly dedicated and very experienced instructors. They are said to be much more labor-intensive for their instructors than are comparable face-to-face courses. Some analysts argue that some of these courses can be much better learning experiences than their in-place equivalents. But given these requirements of unusual instructional skill, experience, and dedication, we would be surprised if these constitute a majority of today's on-line courses.

Even so, we see some signs that the "floor of professional practice" is improving at a few universities that offer numerous distance education courses. There are some new internal consulting groups and workshops for prospective instructors. In some cases these are mandatory; however, they are more commonly discretionary. At least one major university has required that students who take distance education courses take an "on-line orientation course" as of 1999. We have not examined the ways that these support resources work in practice. But, if they help participants to understand the communicational complexities of asynchronous text-based communication, they may help to raise the level of instructional and student competencies for effectively teaching and learning with new media.

This article reports one case study in considerable detail, and explicitly theorizing the conditions under which such courses are organized and taught is well beyond our scope. But it is an important next step. Part of the theoretical analysis would have to examine the socio-technical complexity of the communication and computational support for the courses, and faculty and students' abilities to work with and through them (Star and Ruhleder, 1996; Kling, 1999). Another critical part would include the political economies of the participating universities – for example, the ways that academic administrators are being encouraged to embrace Internet-enabled distance education as new a source of revenue (Carnevale, 1999). Other elements would include an understanding of the

conditions under which potential students take such courses, and the conditions under which faculty teach them. Most seriously, the necessary theorizing would involve the conjunction of these conditions, social processes and practices: the various ecologies of games (Dutton and Guthrie, 1991; Dutton, 1995) in which administrators, students, and instructors come together in making Internet-enabled distance education programs happen.

We have informally analyzed some aspects of B3002 in these terms. The particular mixture of administrative encouragement, students' eagerness and instructor's willingness led to the course being taught. However, the instructor's newness to online education taken together with limited instructional and technological supports led to many students being distressed during the term. We suspect that the course's reliance on asynchronous communication further exacerbated the level of student distress over what would likely have been seen in a face-to-face class. Other game ecologies have sometimes produced more satisfying instructional and personal experiences in distance education courses. We have much to learn about the conditions that create the good, the bad, and the ugly in Internet-enabled, text-based distance education.

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Appendix

Interview Protocols for students in B3002

1. How familiar were you with computers before taking this course?

2. How many credit hours are you taking this semester other than this course? And how much work do you have outside of school work?

3. Why did you decide to take this course through distance education?

4. How much time do you spend working on this course weekly?

5. How do you like this web-based class?

6. What do you gain most from this course?

7. What are the biggest problems so far to take this course? What is frustrating most as a part of taking this class?

8. How do you understand other students without seeing them face-to-face?

9. How do you feel the sense of a community of learning in this course?

10. Is there anything else you want to tell me about this course?

11. Is there anything else I should know?

Interview Protocols for the instructor in B3002

1. What do you want your students to gain from the course?

2. How much do you spend preparing and teaching this course?

3. What are the enjoyable parts in teaching this course?

4. What are the difficulties to teach this course?

5. When you have a problem whom you can ask for help?

6. What instructional technique do you apply to this course?

7. What are the issues that you particularly concern when you teach this course in this way?

8. What is your impression about the students in the course?

9. Is there anything else you want to tell me about this course?

10. Is there anything else I should know?

Endnotes

[1] In this article, the terms Internet-enabled, web-based, computer-mediated and online courses are used interchangeably with asynchronous distance education. In practice, these courses can utilize such a number of different communication supports (either asynchronous or synchronous), such as text, voice, video, discussion forums and even face-to-face meetings in addition to the electronic communication that any two courses may be extremely different in their communicative structurings. The major focus of this paper is on Internet-enabled courses that rely primarily on

asynchronous, text-based communication media.

[2] This generalization is based on our reading of dozens of practitioner and popular articles about Internet-enabled distanced education that we have reviewed informally during the course of this research. A systematic review of these vast practitioner and popular literatures is well beyond the scope of this article.

[3] For a review of the literature about the ways that frustration can impede learning, see Hara and Kling (1999b).

[4] One colleague commented: "through large samples of students and quantitative methods I have found data that supports your findings on instructor feedback. In particular, we see that the timeliness and quality of instructor feedback are related to student outcomes measures, as well as student discretionary behaviors (e.g., intent to take another class on-line, intent to communicate positively about on-line education to other students) (Hoffman, 1999).
[5] B3002 is a pseudonym used in this study.

[6] Two students who were taking B3002 far from the university dropped the course after experiencing technological problems.

[7] Since the class size was so small, if we described students' profiles in this article, the instructor could identify individual students. Therefore, in order to protect the informants, we decided not to include individual students' profiles, though they would have helped readers understand this case more deeply.

[8] MUD is an acronym for "Multi-User Dungeon" developed for multi-players play of the Dungeons and Dragons game in 1979.

[9] Although this methodology has a disadvantage in that researchers cannot take account of every comment from informants during think aloud sessions, the methodology is widely used for usability tests. Dillon claims that the use of verbal protocols produced during the tasks allows for more accurate information than that obtained during retrospective verbal reporting.

[10] More complete interview data are reported in Hara and Kling, 1999b.

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