

The Missing Borders: Pedagogical Reflections from Distance Education

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Abstract

Advanced technology brings excitement and promise to the area of distance education, but it also generates questions in what it means to be teaching and learning in media-rich environments. This paper addresses the issue by contrasting distance education and face-to-face education. The students and teachers struggle with distance education because they do not realize that the face-to-face methods of instruction, especially the lecture format, do not match the distance education methods and media. The supporting elements of traditional classroom instruction and management are not present, which creates an environment that looks like traditional instruction but most of the teacher-student methods of communication are hindered. Using the concept of "borders," the authors reinterpret the existing problems with previously ignored or hidden factors. Examples are drawn from a case study of distance learning courses. The concluding section of the paper offers suggestions for improving existing practice by recognizing the long-standing tradition of face-to-face education and mutual interaction of machine and people.

Distance education produces a different teaching-learning setting than face-to-face instruction and many teachers and students find it difficult to accommodate this form of interaction. Traditional teaching techniques do not work in distance education settings because although it looks like a regular classroom environment, the method of communication changes the dynamics of interaction. In the following vignette, a student was struggling to get the instructor's attention. Because the instructor was not physically present in front of him, he experienced difficulty in communicating.

Tom leans forward towards the microphone 10 inches in front of him. He is waiting patiently for the conversation between the teacher and another student at the other site to end so that he can ask the question that occurred to him over 10 minutes ago. It seems to him that if he misses the next moment, he feels he may not get another chance to get the class's attention back to the topic of his question. The instructor cannot see his raised hand, nor the puzzled look on his face. (Field note, multiple-site teleconferencing classroom)

Tom was a student in a university-level teleconferencing classroom. He was attempting to ask a question using a real-time audioconferencing system as he normally would in a traditional, face-to-face classroom. In an effort to bring his question to the instructor's attention, Tom may not know why those ingrained classroom actions he learned in childhood have suddenly become problematic. Is the technology, the instructor, or the student to be blamed for Tom's unexpected and troubled classroom interaction?

Although advanced technology brings excitement and promises to the area of distance education, it also generates questions and doubts. Tom's example is not atypical. Distance education studies have found students' satisfaction as a perplexing phenomenon. In a review of adult students' learning in distance education (Moore, Thompson, Quigley, Clark & Goff, 1990), ten out of eleven empirical studies examining student's achievement found that the distance students performed as well, if not better, than students in comparative, traditional face-to-face classes. The study of their satisfaction and attitudinal aspects, however, had mixed findings. Distance students frequently reported a sense of isolation and an urge of wanting to see the instructor. Historically, there has been a high dropout rate in distance education programs (Garrison, 1989), and distance learning has been perceived as a "tough" learning situation (Thompson, 1989). For decades there has been a debate on the level of independence required of the students (Guligemino, 1977; Long & Agyekum, 1988) in order to sustain the harsh learning environment of mediated instruction where students receive little or no support from the instructor (Thompson, 1989).

The advance of technology has brought hope to resolve the problems of communication barriers. With the rapid improvement of speed and capacity of computers, instantaneous feedback of multiple channels from the instructor is now possible. For example, video components have been added to the systems that connect students and teachers hundreds and thousands of miles apart. Students previously craving interaction with the instructor now have the opportunity to see the instructor's live image on a screen and their questions can be captured by a voice-activated video camera.

With all the support of up-to-date technology, one might assume that teachers and students now have the freedom to communicate all they want and truly enjoy their distance learning experiences. However, studies of different modes of instruction have found that video conferencing is worse than audio-only teleconferencing classes in terms of students' satisfaction (Dillon, Walsh, Weintraub & Katz, 1992). The resemblance to face-to-face communication did not ease the anxiety that people had from the

disconnection with the instructor.

The Strange World of Distance Education

There seems to be something wrong with distance environment. People do not seem quite able to do the things they would normally do in a regular face-to-face situation. In the example of Tom, above, he was struggling, but not sure with what. There was awkwardness in what he was trying to accomplish. In a qualitative study (Hsu, 1997) conducted with three distance education courses, similar situations were observed over and over again. In one of the cases, Dr. S, who had been exposed to the distance environment for the first time, found it frustrating when trying to learn what was going on with the students.

I cannot see and hear what is going on with them. Sometimes I asked them for questions, but there was only silence. I do not know how to put it. It's just like there is this anemic group interaction instead of a robust interaction. Students are contributing twenty-five percent of what they could contribute to the class. They did all right on the exams. I feel like a technician doing a particular job like fixing a radio. If I turn it on, and it works, then I've done it right.

It was not uncommon that people found themselves operating in the darkness in a somewhat strange world. In another instance, Dr. S was using a whiteboard on the computer. Instead of writing and lecturing at the same time as she would with a classroom blackboard, Dr. S found that the real-time transmission of data kept interrupting her writing and made her give up on writing on the board entirely and use prepared presentation material instead. In another case, the students had an open microphone in front of them, but they found it difficult to answer the teacher's question because they did not have a protocol for the order of answering. Many cues such as a gesture or an eye contact that signaled the other students' readiness to talk were missing. Those who wanted to answer, therefore, had to wait, or guess when and how to address their answers or comments. A simple task in a face-to-face setting such as voicing opinions thus broke in the distance environment and becomes difficult to accomplish.

Being familiar with face-to-face classroom settings, we take many things for granted. We follow the explicit and implicit rules of daily classroom practice without having to think about it. When teachers and students migrate to a distance setting, however, basic practices are altered. The difficulty that teachers and students have experienced in the cases above presents an issue that cannot be examined in terms of the technology or human factors separately, but by considering both at the same time (Bruce, 1997). To understand the strangeness of distance education experiences, it maybe helpful to pause for a moment from looking at the practical concerns and turning to a theoretical discussion. The concept of "border" may provide some insights into why the world of distance education is a strange one for those who are used to face-to-face situations.

The Concept of Borders

John Seely Brown and Paul Duguid's (1993) study on software design introduces the concept of *borders*. According to them, a "border" is a "genre," a set of essential elements of the cultural context developed through practice by a community of users. In the use of technology, a community of users constructs its border elements. One of the problems for people who encounter technology is the failure to recognize this array of peripheral elements that surround the technology being used. Brown and Duguid delineate the role of these supporting elements with respect to technology design and use:

Use of shared artifacts is critically supported by latent "border" resources lying beyond what is usually recognized as the canonical artifact. Designers and users intuitively develop these unnoticed resources over time as artifacts are integrated into ongoing practice and stable conventions or "genres" grow up around them. (p. 3)

The metaphor of borders draws our attention to the elements that have been conventionally ignored and therefore not discussed. These border elements are usually developed over a long period of time and grow out of practice. In the interpretation of technology, these integrated parts are not perceived as part of the technology, but they strongly influence its use. Brown and Duguid emphasize the influence of the peripheral parts, the border elements, to the central artifact. Technologies, like texts, can be interpreted differently with different borders:

A phrase such as "This is a hijack" can reasonably occur in a number of genres?in, for instance, a hijack note, a book about hijacking, or a child's game. Pilots, FBI agents, juries, book readers, or other players in a game need some clues to know which they are dealing with. Clearly, when the phrase occurs in a book on a beach, its conditions of interpretation are quite different from when it occurs in a note in the right hand of someone who might carry a pistol in the left. The different borders set up different expectations.

Brown and Duguid also demonstrate how the border elements play a role in technological transfer. In the case of encyclopedias, for example, the accuracy and the authority of the information contained is signaled by the hefty hard cover of the volume that is expensive for publishers to reproduce. When encyclopedias are produced electronically, on the World Wide Web, for instance, the digital forms no longer carry the same weight as the hard covers. Subsequently, the readers may be confused over the seriousness the words carry given the ease of change.

The border concept has implications for education. Formal education has been practiced in traditional face-to-face settings for decades. Together, teachers and students have developed numerous borders that support current practice in face-to-face setting. In distance situations, many of the border elements that have been developed in the face-to-face learning community may be altered or missing entirely, thereby creating problems in establishing the proper framework of expectations for conducting teaching and learning.

In light of the concept of borders, it is possible to interpret Tom's struggle in the scenario cited at the beginning of this paper. Asking a question in a class, as it reveals, is not a simple matter of speaking out loud the ideas. It involves hand-raising, which signals the student's readiness to ask a question, a pause in the instructor's lecture to allow time for an interruption, and the instructor's acknowledgment representing willingness to take the question. There are other "border" elements, such as the topic being discussed at the moment, and other students' reactions to the questions. Taking all that into consideration, question-asking is indeed a complex act. At the moment a question is asked, numerous decisions have been consciously and unconsciously made. Although these integrated elements of question-asking are normally carried out smoothly in a face-to-face setting, they are interrupted in a situation in which the teacher and students do not meet in person.

Because previously face-to-face experiences are crucial to the interpretation of experiences in distance learning, it is worthwhile to take a closer look at some of the premises that underlie the practices of face-to-face instruction.

Reflecting on Face-To-Face Experiences

The problem situations that occur in distance learning classes have revealed factors integral to classroom activities. One of these factors is that instructors and students bring to the distance learning classrooms assumptions about communication based on face-to-face situations. The dominant mode of current face-to-face practices is teacher-centered and lecture-centered class. The supporting elements of traditional classroom instruction and management are not present, which creates an environment that looks like traditional instruction but most of the teacher-student methods of communication are hindered.

The instances of Tom and Dr. S cited above are good examples.

As the borders literature indicates, the formation of border elements occurs in the development of a user community. The integration of the border elements and activities develops over time. Classroom communication practices developed and fostered in face-to-face instructional settings must be reconstructed for the distance learning environments. The failure of this reconstruction exposes them and provides an opportunity for critical examination.

The Role of Technology. In face-to-face settings, machines such as televisions or overhead projectors are often used as supplement lectures. The machines themselves are used more like tools and are independent of the teacher/student relationship. In a distance setting, however, the situation is different; the technology is a part of the communication process. The audio equipment becomes a part of the act of speaking, as illustrated by the role of the microphone in the process of asking questions. Other supporting communication cues or border elements of face-to-face settings, such as nodding heads and agreeing gestures, do not function as expected. Awkwardness and inconvenience are therefore associated with the use of the technology. When it is noticed at all, the technology is interpreted as interfering (Hsu, 1997).

In the case of Dr. S, the interference of the technology was unexpected. The computer display screen was designed to simulate a blackboard for teachers to write on or a television screen to present information. Writing, however, is much different with the computer than with the blackboard. There are time lapses between writing strokes with the computer such that continuous writing on the screen becomes almost impossible. Especially when lecturing and writing at the same time, writing with the electronic pen becomes uncomfortable. Dr. S was so uncomfortable she decided to drop the idea of writing with the pen. Although she practiced with the pen before the course started, the actual use of it in class was more intimidating than she expected. Lecturing with writing was the primary means Dr. S used to conduct her classes, but she had to give it up in this class and change to do something else. Technology, in this case, was clearly not an independent tool that merely supplemented classroom practice; it was an essential defining part of the classroom interaction.

The Role of Teacher and Students. In teacher-student communicative interactions in a face-to-face classroom, the teacher's role is often dominant. Teachers are the central source for disseminating information, the creators of classroom rules and activities, and the authorities for assessment. Students, on the other hand, are often placed in a passive position of receiving instructions, following them, and receiving evaluations. As in the familiar IRE pattern (Mehan, 1979).

The traditional context of the face-to-face classroom reinforces and supports the instructor's centrality and authority. Often, the room arrangement in a face-to-face class setting preserves and encourages the role of the instructor as the central authoritative figure. Other aspects of traditional teaching-learning practices such as the curriculum, pedagogical theory, and class management procedures, echo this "teacher as authority" tradition. Gillard (1993) presented a succinct illustration of this face-to-face tradition and the power unbalance it symbolizes:

Contiguous (face-to-face) education in its most typical form...may be seen...through the binaries centre/periphery, one/many, high/low; and in any other of the elements of power which issue from a politics of education which keep students in their place, rather than setting out to empower them.
(p. 184)

Furthermore, Gillard points out that the spatial arrangement creates not only physical separation of the teacher and the students, but the sentiment that sets them apart in their power relationships:

The typical structure of the lecture theater from the centre of which the lecturer's gaze can engage with that of any student is similar in design and intention to the Benthamite Panopticon discussed by Foucault in *Discipline and Punish* (1979), a prison designed in such a way that the warders at the centre of a wheel-like structure can look down any of the spokes to see what any prisoner is doing at any time. All the prisoners are visible to their guards all of the time. The structure of this environment produces not only unequal

power relationships but a magisterial style of teaching as well. (p.184)

A distance learning class situation does not support this tradition. A computer or projection screen replaces the position where the teacher ordinarily sits or stands. What the students can look at during the class becomes optional.

In a traditional face-to-face class, the teacher can see some of what is going on with the students. The teacher has the right and the responsibility to look for students' reactions, to acknowledge or ignore reactions, and to set forth the appropriate pace and style accordingly. For class interaction, teachers are expected to take the initiative. Students, in this environment, wait to be seen or for an appropriate time to speak. When they have difficulty in doing so, they expect that the instructor can pick up their frustration and anger. While in a face-to-face situation their facial expressions and body language might be noticed by the instructor, in a distance class, their distress can easily go unnoticed. Unless students make deliberate efforts to express themselves, their negative feelings can accumulate and aggregate.

The format of lecturing is also subject to scrutiny when it comes to distance education. Although the lecture format is well-supported by a face-to-face setting, and has been the main means for most classroom interaction, it is not well-suited to a class situation where small groups of students are scattered across multiple locations. Even when the quality of the audio and video communication channels improves so that the students hear and see the lecture better, straight talking by the instructor for the entire class is not the only mode of instruction that can be done with a multimedia delivery system. The dominance of the lecture format, and therefore the potential of imparting knowledge from the instructor to the students, has to be challenged when education moves from face-to-face to a technology-rich distance mode.

Complying with the authority of the teacher, students carry out their daily class activities, often with repeated interactions with the teacher. For example, when a student encounters difficulty in understanding the material a teacher is presenting, he or she would want to clarify the content by raising hands and asking a question. If the problem is not resolved, the student would probably want to pursue further by talking in private after the class. As easy as this sounds, those activities do not work at a distance. For students who are accustomed to study for a class using those strategies, they often encounter difficulties in a distance setting, and perceive technology as a barrier to their daily schooling.

In the case of Tom, the channels he could normally expect to have in a regular face-to-face class to interact with the instructor may not be available, such as going back to the topic during the class, or talking to the teacher after class. Students with experiences similar to Tom's could be disappointed and frustrated at first, but some of them soon shift their source of help from the teacher to the fellow students. In a distance course, the opportunity and intensity of peer interaction can thus be enhanced. The shifted concentration from teacher-student interaction to student-student interaction has been observed over and over again in distance situations across the technology. Perhaps because it is not an expected classroom practice, however, the strengthened relationship

among peers, has typically developed unplanned.

The closeness between students also brings our attention to other previously ignored factors in education settings. The seating in the classroom, for example, appears trivial but is of great importance in distance classes. At the beginning of a class, students may pick a seat at random, or casually sit with familiar faces. In a face-to-face class where students do not have much interaction during the class, except during small group activities, where they sit may not matter that much. In distance classrooms, however, it significantly determines whose notes one refers to and whose perspectives one adopts. During the class, when students have to seek immediate help from others, the person in the next chair is the one they turn to. In the case of Tom, had he sat by the side of someone knowledgeable and willing to help, he would have been much more successful in gaining help rather than relying on the chance of getting the attention from a remote instructor. As a consequence, the student sitting in the next chair has a great impact on one's learning. He or she is the helper, the critic, and the opinion shaper. As Hsu (1997) observed, students in each site allied their opinions with the neighboring students. They shared similar attitudes and behavior towards the course, the technology, and the instructor.

Revisiting the "Hardness" in Distance Education

Distance learners frequently encounter harshness during class that leads to view that distance education is a "hard" situation for teaching and learning. It is true that students often have problems in the process of communication and interaction, but hardness in distance education may be a relative term. Frustrations, anxiety, and disappointment are not all that uncommon in distance classes. Had students in Hsu's (1997) study filled out a questionnaire during the course, they would probably have reported as "low satisfaction," as many others have found. Although some students blamed the technology, other people, or themselves for this dissatisfaction, researchers have not been able to clearly delineate the actual cause of their dissatisfaction.

Following the comments above, one plausible interpretation is that people have to break the old and familiar in distance education. They have developed many skills and strategies that are suitable to face-to-face settings, but may not work in the new settings. Being challenged or even threatened, they can feel uncomfortable. Feeling uncomfortable may in turn encourage students to work harder on their own, or to find help from others. The discomfort is transformed into incentives that help the students discover new ways of evaluating their long-held beliefs.

From missing the border elements of communication to forming new concepts and strategies to survive at a distance, teachers and students in the three distance classes studied by Hsu (1997) sought different ways to realize their goals in class. Some were successful and some were not so successful. For many of the participants, the distance learning experiences may appear to be full of frustration and dissatisfaction, but at the end may have educational value by highlighting new ways of doing things. Whether they were making deliberate choice or not, many of them had gradually become aware of the

new situation and developed ways to deal with it. The three courses revealed positive sides of the seemingly negative distance education experiences. These suggest ways to respond to the phenomena of missing borders in distance education, or even education in general.

Insert Table 1 about here

Conclusion and Implications

The three distance education courses reveal the interactions occurring at a distance and the role the technology plays. Distance technology has created a different environment from face-to-face situations, but the differences cannot be seen by examining only the end-product of learning. Paying attention to the communicative and learning processes on the other hand, provides insights into how the underlying assumptions operate in distance class interaction. The difficulty and problems that people have encountered at a distance afford an excellent opportunity to look beyond what we can do as teacher and students.

In fact, an examination of distance education provides challenges to both traditional face-to-face educational practices and assumptions. It leads us to question the authoritative role of the teacher and sole reliance on whole-class instructional delivery methods. Rather than limit ourselves to one mode of teaching and learning, we can expand our horizon to a broader array of interactional approaches; rather than one instructional strategy, distance education suggests a newer and enlarged view about what teaching and learning can be. Distance education is thus not a replacement for face-to-face education. The role of technology has changed distance education and challenge our views about education in general. Newer technologies provide new opportunities for distance education, but to use the technology more effectively, we need a greater understanding of the process of teaching and learning.

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Table 1
The Missing Border: Elements and Suggestions for Changes

The missing border elements	Suggestions for instructors	Suggestions for students
Visual cues between teacher and student	More explicit communication about intention and philosophy. Using multiple channels to communicate with the students.	Less reliance on instructor as authority to give orders.

Exchanges between students	Encourage site-based activities that utilize the naturally occurring interaction of students.	Learning to use small group activities, and utilize resources other than the instructor.
Technical features that enable smooth writing on the screen	Give up the blackboard metaphor as presentation tools. Consider media-rich instructional material that is not limited to text nor linear approach.	The same as for the instructor.
Technical and social elements for note-taking: Time, tools, and emotions	Provide handouts. Utilize activities other than traditional lecture/note-taking format. Use alternative evaluation methods that require less rote learning.	Use various learning strategies.
Timing and protocols for help-seeking from the instructor	Establish multiple channels for teacher-student and student-student help.	Assume an active role in finding the help needed from various sources. Negotiate with the instructor to establish the help system.