Student Motivation for Learning at a Distance: Does Interaction Matter?

Kathleen D. Kelsey, Ph.D.
Assistant Professor
Oklahoma State University
466 Agricultural Hall
Stillwater, OK 74078
kelseyk@okstate.edu

Alan D'souza, Ph.D.
Director of Research and Development for TRiO Programs
Wichita State University
105 Grace Wilkie Hall
Wichita, KS 67260-0008
dsouzaalan@yahoo.com

Abstract

The case study evaluated a distance education program offered by a land-grant university agricultural college. The study used Holmberg's and Moore's theoretical frameworks of didactic conversation and multiple interactions to determine the importance of interaction on the efficacy of distance learning. The mixed methods approach used an original survey instrument and long faculty interviews. While students found the technology manageable, the faculty perceived technology as a barrier to effective instruction. Both, students and faculty were satisfied with the nature of interactions between them, although the faculty had individual preferences and faced some barriers to interaction. The study supported Holmberg's and Moore's contention that interaction may be a predicating factor for the success of distance education courses. The study also found that student-student interaction was not considered critical to learning. More research is necessary in the direction of curriculum modification to suit distance student needs.

Introduction

Offering distance education courses is consistent with the mission of the land-grant university and is a critical endeavor for the survival of the modern educational institution (Kambutu, 2002). Keegan (1990) defined distance education as a system characterized by 1) the separation of instructor and student during most of the instructional process, 2) the influence of an educational organization, 3) provision of student assessment, 4) use of educational media to deliver course content, and 5) two-way communication between instructor and student.

With the intent of making university courses more accessible, an agricultural college situated in a southwestern land-grant university delivered a series of graduate level courses that would lead to a Master of Science in Agricultural Education or a Master of Agriculture degree. Distance delivery began in the spring of 2001 and continues today. Five faculty volunteered to teach via distance modes and used a variety of technologies including 1) Interactive Video Conferencing (IVC), 2) Streaming Video, 3) videotaping the live course and sending a copy of the videotape or a CD-ROM to distance students, and 4) Blackboard.com®. In the case of IVC courses, students

had the option to attend the weekly three-hour lectures live at a remote IVC download site or to view the Streaming Video of the same lecture on the Internet. Blackboard.com®, videotape, and CD-ROM courses were asynchronous only.

An important aspect of any distance education program is evaluation for continuous improvement. Unfortunately, there has been a lack of systematic evaluation research focusing on distance education courses (Roberts, Irani, Lundy, & Telg, 2003). Only 19 states have developed systematic evaluation programs to assure the quality of distance education (National Governors Association, 2003).

Purpose Statement

The purpose of this study was to evaluate the overall distance education program offered by the college, specifically focusing on the impact of the distance education context on learning using Holmberg's (1995) and Moore's (1989) theoretical frameworks for interaction in distance education.

The main research questions that guided this study were:

> 1. Did the student-content and student-interface interactions motivate learners to favorable learning outcomes?
> 2. Did the learner-learner interactions motivate learners to favorable learning outcomes?

Theoretical Framework

Holmberg (1983) believed that within the context of formal education, students learn by engaging in guided didactic conversations with their instructors. The students express their ideas, and then the instructor guides the student in elaborating, correcting, or redirecting those ideas. Public and direct student-instructor conversations are essential characteristics of learning. Guided didactic conversation promotes a personal relationship between the instructor and the student, thus creating greater motivation in the student and increased learning outcomes.

Holmberg's theory of distance education was based on seven postulates guided by characteristics of didactic conversation (Holmberg, 1995, p. 47). They included 1) feelings of personal relation between the instructor and student to promote study pleasure and motivation; 2) that such feelings would be supported by well-developed instructional materials and two-way communications; 3) that study motivation was important for the attainment of study goals; 4) that the atmosphere of friendly conversation favors feelings of personal relation according to postulate 1; 5) that communications within natural conversation are easily understood and remembered; 6) that the conversation concept can be successfully translated for use by the media available to distance students; and that 7) planning and guiding the curriculum were necessary for organized study at a distance.

Moore (1989) wanted distance educators to include all members of the learning community in educative interactions, not only the instructor and students. He suggested that when designing effective distance education courses one should include interactions between the student and their instructor, students and students, and students and the content. Reciprocity is necessarily built into Moore's theory in that interaction is both unidirectional and bi-directional in distance education.

Learner-content interaction occurs when a student reads a book, views pre-recorded videotape, or

in some way interacts with inanimate learning resources. It is hoped that in order to master the content, the learner will engage in an internal didactic conversation (Holmberg, 1983). Learner-instructor interaction is what differentiates self-study from distance education. The instructor provides the learner with an organized plan, or curriculum, for mastering the content and communicates with the learner throughout the process as Holmberg (1995) stated in Postulate 7.

Learner-learner interactions take the form of group projects, discussion group members, etc. The role of learner-learner interactions to the overall effectiveness of distance education in the literature was mixed. Some students reported that other learners were essential to their success in a course, while others suggested that fellow learners actually detracted from their success (Biner, Welsh, Barone, Summers, & Dean, 1997).

Hillman, Willis, and Gunawardena (1994) added learner-interface interaction, the concept of interaction that occurs between the learner and the technologies used to deliver instruction to Moore's (1989) framework. Hillman, Willis, and Gunawardena (1994) argued that a student's skill with the communication medium necessary to participate in a distance education course is positively correlated with success in that course. In order to gain any meaning from the course content, the student must be literate in the communication medium's rules of interaction.

Opportunities for guided didactic conversations in the college's distance education courses came from the use of IVC technology, email, telephone conversations, and face-to-face meetings between students and their instructors. Students had opportunities for learner-instructor, learner-content, and in the case of IVC courses, learner-learner interactions. Students were also required to engage in learner-interface interaction.

Methods

The research design was a case study, the case being the agricultural college distance education program in its entirety (Stake, 1995; Yin, 1994). The methods used for collecting data included the university student information system, an original student questionnaire was developed by the authors using the literature as a framework, and long, semi-structured, face-to-face interviews with five faculty who taught at a distance (Patton, 2002).

The questionnaire included a variety of response sets such as Yes-No, multiple-choice, fill-in the blank, Likert-type, demographic, and open-ended questions that were designed to satisfy the research questions. One of the multiple-choice items listed the frequency of interaction of never, rarely, frequently, and always. The Likert-type ratings included strongly agree, agree, disagree, and strongly disagree and were scored 4-1 respectively. Not sure/not applicable was coded 0 for the analysis. Survey data were analyzed using SPSSâ v. 8.0. The statistics used were mean and frequency. The Cronbach alpha for reliability of the survey instrument was calculated at 0.72.

A panel of experts consisting of two faculty members with expertise in distance education confirmed content, construct, and face validity of the survey. The instrument was found to be valid. Validity of qualitative data was sought by Merrian's (1995) strategy of triangulation, peer examination, and an audit trail.

To expedite data collection and increase response rate, the students were telephoned and guided through the survey with the researcher. Due to the small population size (N=88) pilot testing was conducted during the first 5 telephone interviews with students. After each telephone interview slight modifications were made to the instrument to increase validity, clarity, and the quality of the data collected.

The qualitative data set (five faculty long interviews) were analyzed and reported following Creswell's (1998) procedures:

> 1. *Organization of data.* The interviews were tape recorded, transcribed, and cleaned by a research assistant. The transcript was then sent back to the subjects to confirm accuracy. After confirmation of accuracy the text was loaded into the qualitative data program ATLAS.ti® for analysis.
> 2. *Categorization of data.* The data were clustered into meaningful groups (coded) using ATLAS.ti® as an organizational tool.
> 3. *Interpretation of the data.* Statements that fell into like codes were examined for specific meanings in relationship to the purpose of the study.
> 4. *Identification of patterns.* The data and their interpretations were examined for themes and patterns that characterized the program and allowed the researchers to draw conclusions.
> 5. *Synthesis.* An overall representation of participants' responses was created where conclusions and recommendations were drawn based on the data presented.

Findings and Conclusions

Eighty-eight graduate students (Masters and Ph.D.) had successfully completed course work at a distance from fall 2000 to fall 2002. Thirty-one students completed the telephone questionnaire for a 35.23 % response rate. Demographic data were downloaded from the student information system for all 88 students. The mean age of the distance education students was 39.27 years (sd=11.03) and most were male (n=62, female n=26). Seventy-eight percent of the students were white, 15.2% were Native American, 4.4% were African American and the remaining 2.2% were mixed. Seventy-four percent of the students were part-time students and the remaining were full-time (17.4%) or returning students (8.6%). The mean number of courses taken by the students was 1.22 (sd=0.75). Students lived a mean distance of 119 miles (sd=88) from the university.

Research Question 1: Did the student-content and student-interface interactions lead to favorable learning outcomes?

The survey addressed the student-interface interaction construct at several levels. First, the respondents were asked a series of questions about website support for the course they had taken. Most students (n=29) indicated that their course had a website to support the course and felt that it provided them all the information they needed to be successful during the course. Twenty-eight students (90.3%) also indicated that they got all the course documents and handouts necessary from the course websites. It is concluded that course websites were successful in delivering course materials to students, and students were able to access websites without difficulty.

The participants were asked about downloading location, and whether they had problems downloading content from the Internet (Table 1). The majority of problems students faced with the technology in the distance education context were associated with the IVC and Streaming Video technology. In one class, students were only able to download eight of 14 lessons because of Streaming Video technology failures. It is concluded that the majority of students downloaded course content from a work computer and that one-half had difficulty downloading the Streaming Video from the Internet.

Table 1. Location Used for Downloading Distance Education Course Content

Question	Frequency	Percent

Location where Streaming Video lectures were downloaded		
Home	4	22.2
Work Place	13	72.2
Work Place & Home	1	5.6
Total	18	100.0
I had problems downloading the Streaming Video lectures from the Internet		
Yes	15	48.4
No	16	51.6
Total	**31**	**100.0**

Respondents indicated the kinds of technology problems they faced at the remote ICV site they attended. Most complained that either the picture or the sound or both were missing during the broadcast. Many students faced problems connecting with the university via IVC equipment at the scheduled time of the lecture. One student indicated that the problems were acute during the first two weeks of the course, but were resolved subsequently. One respondent indicated that when the transmission was not working, the instructor would inform them with an email so that they got a warning. In spite of IVC failures, the respondents indicated that technology failures were not a barrier to learning. It is concluded that students were satisfied with the IVC download sites if they chose to attend the lecture live. The sites were well supported with technical assistance (a staff member employed by the host institution was on site to assist the student during the broadcast) and were conveniently located to the student's home so that the student did not have to travel more than 20 miles to attend the lecture live.

All five faculty were asked to discuss the technological problems they faced, the conflict between serving the needs of local and distance students simultaneously, the training they received for teaching at a distance, and the type of technology support they would prefer.

Faculty were disappointed and frustrated with the technology, specifically IVC and Streaming Video, used to offer courses at a distance. They felt that either new technology should be adopted, or they should be provided additional technical support to deal with the constant onslaught of crisis caused by technology failures during lectures.

The faculty perceived technological problems as two fold: those that affected the students exclusively, and those that affected both the students and faculty. Among those that affected the students were IVC transmission failures from campus to the remote site. One faculty stated "students make an effort to show up to this site and then they get nothing; they get no audio and no video. They try to ask a question and they get cut off." Some faculty members also considered Streaming Video problematic as no sound or image or both were recorded during the lectures on numerous occasions.

As far as the problems faced by both the faculty and students were concerned, the faculty felt that the time involved in getting the technology to work was a detractor from teaching and learning. "I spent more time and effort fighting with the technology than teaching," said one faculty. She felt that "technology failures were extremely frustrating…and I can only imagine what students were going through trying to participate in the class." Another faculty pointed out the time lost in communicating through the IVC system. Voice transmission was choppy and delayed, for example, if a student asked a question it would take two seconds for the sound to reach the instructor. Thus, people were constantly talking over each other causing further delays in

communication. The outcome was a loss of student involvement as students learned that it was not worth the effort to ask a question.

Four faculty members declared that the IVC and Streaming Video technology was a major problem in serving distance education students. One faculty affirmed that the technology was certainly not appropriate to teach his courses, while another found Streaming Video unimpressive. One faculty member clearly stated that the technology "did not work. It failed. The technology was a failure overall."

Faculty received training to teach at a distance by educational technology services staff. The training consisted of how to switch on and off the system, and how the faculty member could control the display on the screen and communicate with other sites. Faculty reported that the training was adequate and they were satisfied with the training.

All five faculty who taught at a distance were supported by a graduate assistant who worked 20 hours per week. The faculty considered the role of the assistant important; however, felt that the assistant was not appointed specifically to serve as a distance education assistant. The assistant had no training regarding trouble-shooting technology problems. So the faculty expected additional technical support besides a TA for the distance education courses.

It can be concluded that 1) most faculty members were dissatisfied with the technology used to offer courses at a distance, 2) faculty felt that they could not balance the distance and local students simultaneously, 3) faculty received adequate training for teaching at a distance, and 4) faculty required, but did not receive, qualified technical support for teaching at a distance.

Research Question 2: Did the student-instructor and student-student interactions lead to favorable learning outcomes?

Instructor-student interactions were provided via IVC during the lecture, and by using email, telephone, and face-to-face meetings. Students chose to use email and telephone as the primary modes of communication between themselves and faculty (Table 2). Distance students reported that interactions between themselves and faculty were helpful, frequent, and consistent. Distance students attending IVC classes reported that the instructor interacted with them frequently during the class as well (Table 3).

Table 2. Student Modes of Interaction with Faculty

Mode	Frequency	Percent
Email	25	89.3
Telephone	25	89.3
Letters	5	17.9
Meetings	20	71.4

Student-student interactions were not formally provided in the majority of the courses. One instructor eliminated team project requirements for distance students because of the logistical difficulty in coordinating meetings. The same instructor, however, published students' email addresses, and encouraged students to interact with each other as needed. If distance students attended an IVC site they may have shared that site with others, but most often the students were alone. Students reported that student-to-student interactions were not critical to their success and were the least important form of interaction for them.

Table 3. Nature of Interactions between Students and Faculty

Question	Frequency	Percent
I contacted the instructor/professor regularly during the course		
Rarely	5	16.1
Frequently	21	67.8
Always	5	16.1
Total	31	100.0
I received regular feedback from the instructor/professor		
Frequently	13	41.9
Always	18	58.1
Total	31	100.0
The instructor interacted with the distance education students during the IVC lectures		
Never	1	4.3
Rarely	1	4.3
Frequently	9	39.1
Always	12	52.3
Total	23	100.0
Interactions between my instructor and I were helpful		
Agree	2	6.5
Strongly Agree	29	93.5
Total	**31**	**100.0**

The faculty interviews revealed three issues concerning interactions with distance students: 1) the mode of communication, 2) the frequency of communication, and 3) problems associated with communication.

Mode of communication: All of the faculty members said that they used several modes of communication to establish contact with their distance students. The most common modes were email, telephone, and personal meetings. Faculty used each mode of communication according to the purpose of the communication. "Simple and short communication could be accomplished through email. If I felt like I wanted to have a dialogue, I called them or asked them to call me" said one faculty member. Faculty members found email easy to deal with. One faculty member corresponded primarily through email. Email was preferred "due to the flexibility that the person can check it at leisure."

Phone calls were the next most important mode of communication for faculty. One faculty member reported that he preferred to talk with students and cited an example of how he prevented a student from dropping the course via conversation. Another member expressed his dissatisfaction with not being able to talk to all his students via telephone.

Three faculty members held personal meetings with the distance students as necessary when students came to campus. One member made a point of inviting students to lunch when they came to campus to get better acquainted with them.

Frequency of communication: Faculty were satisfied with the frequency of communication between themselves and their distance students. Email was the most frequently cited form of communication among faculty and ranged from daily to weekly contacts with distance students.

Personal meetings and telephone contacts were more sporadic.

Problems associated with communication:

Frequency of communication was a problem for two members, who wanted more communication with their students. However, one member felt that distance students did not appreciate frequent communication. "To be honest, my feeling was distance students really didn't want contact… and were not interested in communicating."

Another critical issue that arose was that distance education students were at a disadvantage as they could not be in the on-campus class. One member said, "the dynamics of a classroom cannot be replicated in a distance education scenario." Another felt that the college and faculty members should "make a commitment to do it well, or we should stop doing it." The faculty members considered poor interaction a major stumbling block for teaching at a distance.

Another barrier to instructor-student interaction was the fact that the instructor had to include two separated groups of students, local and remote, when teaching using IVC. One faculty member stated, "a local student asks a question and we are going on for five minutes, and then I click to the remote people and they are eating pizza, totally disengaged because we haven't been focusing on them."

While discussing the use of technology used for delivering distance education, two faculty members felt that the technology became a barrier to interaction with the local students. "You are bringing in this whole other dimension in the classroom, and you are brining in a whole new team of people, the technologists and the distance students. It was intimidating for my local students; they didn't want to talk on camera or they realized that asking a question would take forever because of the delays in the system so they were extremely reticent to interact with me or the other students." One instructor felt that the technology was very distracting to his students and it took a lot of time away from student learning. Another member had a similar experience. "All students were disappointed, the students at a distance were not happy and the students in class, I know, weren't happy." The faculty members felt that bothered by having to ignore the on-campus students' needs while meeting remote students' needs, or vice-versa, or dealing with technology failures. "I don't want to sacrifice the education of students in class. I don't think it is fair to them," said one faculty member.

It can be concluded that 1) email was the most frequently used mode of communication between distance education students and their instructors, 2) faculty were regular and consistent when communicating with distance education students, 3) faculty members and students had individual preferences regarding mode and frequency of communications, 4) the primary barrier to communicating with students using distance education technologies was the IVC during live lectures.

Implications and Recommendations

Although the results of this evaluation study cannot be generalized past the students and instructors involved, some implications and recommendations are warranted for further practice in distance education.

As Holmberg (1995) postulated, distance students enjoyed and benefited from interactions with their instructors. Students communicated with instructors most often through email, using asynchronous guided didactic conversation strategies. Faculty should continue this form of communication using telephone and meetings as needed by students.

As Moore (1989) hypothesized student-instructor interaction was very important to both students and instructors. Both unidirectional (websites, email, Streaming Video) and bi-directional (email, telephone, meetings, IVC, Blackboard.com®) interactions with the content and with instructors were used by students in synchronous and asynchronous modes throughout the semester. IVC and Streaming Video technologies have shown mixed success in facilitating student-instructor interactions in this case study and should be supplanted with more functional technologies in the future.

In regard to student-content interactions, students were successful in navigating their way through the technologies to meet their learning needs. Student-technology interactions were meaningful when using course websites, email, videotapes, CD-ROMS, and Blackboard.com®, but were at times dysfunctional when using Streaming Video and IVC technologies. The lower-cost technologies of email, telephone, videotape, and CD-ROM were satisfying to students and facilitated all types of learning, including student-content learning; thus, faculty should further develop these options when delivering courses at a distance and discontinue use of IVC and Streaming Video as they proved to be unsatisfying for both students and instructors.

Student-student interactions were not critical to the success of students in this case study and were the least important form of interaction for students. Faculty did not emphasize student-student interaction and students did not demand it. If Moore (1989) is correct in his theory, faculty should do more to encourage this form of interaction by assigning team projects to all members of the course. Chat-rooms, discussion boards, and list serves can also be used to facilitate student-student interactions.

The case study pointed to several questions for future research. Are distance education students really interested in interacting with other students enrolled in the same course? Do faculty members have enough training and expertise to modify the curriculum and methods of instructions to suit distance education needs? Does evaluation of such programs lead to an improvement in the program? Follow-up studies are warranted to document improvements in offering courses at a distance.

References

Biner, P. M., Welsh, K. D., Barone, N. M., Summers, M., & Dean, R. S. (1997). The impact of remote-site group size on student satisfaction and relative performance in interactive telecourses. The American Journal of Distance Education, 11(1), 23-33.

Creswell, J. W. (1998). Qualitative inquiry and research design: Choosing among five traditions. Thousand Oaks, CA: Sage.

Hillman, D. C. A., Willis, D. J., & Gunawardena, C. N. (1994). Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners. The American Journal of Distance Education, 8(2), 30-41.

Holmberg, B. (1983). Guided didactic conversation in distance education. In D. Sewart, D. Keegan, & B. Holmberg (Eds.), Distance Education: International Perspectives (p. 114-122). New York: St. Martin's Press.

Holmberg, B. (1995). The evolution of the character and practice of distance education. Open Learning, 10(2), 47-53.

Kambutu, J. (2002). Administrators prefer technology-based distance learning. The Quarterly Review of Distance Education, 3(3), 341-343.

Keegan, D. (1990). Foundations of distance education. London: Routledge.

Merriam, S. B. (1995). What can you tell from an N of 1? Issues of validity and reliability in qualitative research. PAACE Journal of Lifelong Learning, 4, 51-60.

Moore, M. G. (1989). Three types of interaction. The American Journal of Distance Education, 3(2), 1-6.

National Governors Association. (2003). The state of e-learning in the States. Retrieved June 1, 2003, from Available: http://www.ecs.org/html/Document.asp?chouseid=2705

Patton, M. Q. (2002). Qualitative evaluation and research methods. (3rd ed.). London: Sage Publications.

Roberts, T. G., Irani, T, Lundy, L. K., & Telg, R. (2003). Institutional practices in evaluating distance education among agricultural institutions of higher learning. Proceedings of the Southern Agricultural Education Research Conference, Mobile, AL, February 2-3, 2003).

Stake, R. E. (1995). The art of case study research. London: Sage Publications.

Yin, R. K. (1994). Case study research: Design and methods. (2nd ed.). Newbury Park, CA: Sage Publications.