

A Test Comparison Between Teleconferencing vs. Traditional Classroom Lectures for An Introductory Animal Sciences Course



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Abstract

Institutions are currently seeking alternative ways to deliver a full-line of course material without acquiring additional staffing. Therefore, existing faculty are charged with creating alternative ways to deliver and/or offer course content to students. Hence, the purpose of this study was to determine if teaching an Introductory Animal Science course utilizing teleconferencing technology to a branch campus versus traditional blackboard lecture altered the performance on exams. In this study, identical course material and exams (n=3) were presented by one instructor. The two courses were taught independent of one another, but within the same semester. Over the semester period, students performed equally on each of the exams. However, and not surprising, students that were provided a "traditional" classroom environment versus those taking it at a distance, enjoyed the course much more as measured by evaluations and correspondence. In summary, students did perform equally as well on exams regardless of lecture format.

Introduction

The term "information superhighway" was coined by Albert Gore (Gordon and McKenzie, 1994). The former vice-president Gore used the expression interchangeably with "electronic highway" and "National Information Infrastructure" (NII). The NII is a program charged with making government work better, making the United States a World leader in science, engineering and technology, and delivering to all Americans the information they need when they need it and when they want it - at an affordable price. The Internet is one of the earliest large network systems. The Internet was established in the early 1980's, when the National Science Foundation decided to create a system of five national supercomputer centers to serve the research community and to link the centers to all the nation's campuses via a long distance network (Mitchell, 1994). Since the creation, the Internet has grown from 200,000 networked computers in 1989 to over 2.2 million in 1992 (Mitchell, 1994). Currently there are approximately 400,000 hits on the Internet per day (United States Department of Commerce, 2001). It is very clear that Internet usage and technology has increased rapidly over a very short period. The usefulness of the

Internet through advanced technologies has made "distance learning" very attractive to consumers and universities. Perhaps this technology came at a good time because of the need to maximize all available resources.

In general, budget constraints have increased through out many college campuses. Therefore, the luxury of offering a full curriculum of courses may be a thing of the past and thus, creative measures must be taken to assure those courses/information can be disseminated and/or acquired by individuals. Through the use of distance learning (DL) technologies, the need to disseminate and/or acquire knowledge may be accomplished. And in many cases, DL technologies allow people to acquire the information they want without traveling or possibly living in another area.

The objective of this study was to evaluate student performance on like exams between those taking a traditional classroom lecture versus those receiving the lecture material via teleconferencing differed as measured by examinations.

Materials and Methods

Introductory to Animal Sciences (ANSC102) is a three credit (2 hours of lecture and 1 hour of laboratory) level course and taught in both fall and spring semester on the main campus of Purdue University. The lecture and laboratory are stand alone in terms of testing. The course covers the fundamentals of animal agriculture and then applies these concepts to state and national issues. At Purdue University, several branch campus offer equal courses and one of those is Introductory to Animal Science 101 (ANSC101), and taught at the Indiana University Purdue University (IUPU) Ft. Wayne campus. This course is lecture only for three credits.

In Fall semester of 2000, the ANSC101 course was offered to students at Ft. Wayne by two-way videoconferencing from Purdue University. There were 18 students enrolled at Ft. Wayne campus, while 182 students were taking the similar course on main campus at Purdue University. Even though ANSC 101 and 102 were offered during the same semester, the two were not offered simultaneously. More specifically, students taking the ANSC102 course, which exists on the main campus at Purdue

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University was carried out in a very traditional format, i.e., use of overheads, PowerPoint slides, blackboard, and handouts. The students taking the ANSC101 were provided lecture only from the same instructor teaching the students attending the ANSC102 course. Both classes met twice a week. The ANSC102 lectures were 50 minutes per class period with the remainder accounted for by laboratory assignments. As for the ANSC101, each session was one hour and fifteen minutes per class period. Students taking the ANSC101 received the video signal from a distance education studio (Stewart Center) on the Purdue University campus. Within the studio, the only person present was the instructor for all the students taking the class at the IUPU Ft. Wayne campus plus one facilitator. The video and audio broadcast was controlled by technicians located at each studio and link-up before each class was initiated from the Purdue University, main campus studio. The Purdue University studio was equipped for Power Point presentation as well as for slides, overheads and video. At the main campus, the visuals (one to see the class and another to see what they are seeing) were displayed on two large monitors located on each side in the front of the room. Video image for the students at IUPU Ft. Wayne were made available on a projection screen (4' x 4') by capturing the signal. A microphone was located on each desk at the IUPU Ft. Wayne campus, so questions could be heard in both settings. Each class was tape-recorded and all of the videotapes were made available to the students throughout the semester. The primary course notes as well as additional reading material were made available on a webCt web page, which was identical for both courses.

Grades for both ANSC 102 and ANSC 101 were based on the student's performance on three 100 point multiple choice exams. For the Ft. Wayne campus, the exams were written by the instructor and email/attached to the facilitator along with the answer key. Grading at Ft. Wayne campus was done by the facilitator. Grades were compared between the two different sites by using a nonparametric test, KruskalWallis Test of scores.

Results and Discussion

In this study, there were no differences noted in student performance on exams, when comparing grades from the main campus versus those obtained at the IUPU Ft. Wayne campus (Table 1). In fact, the overall mean between the two independent classes was nearly identical (77.1 + 12.9 at the Ft. Wayne campus versus 78.9 + 10.9 at the main campus). Despite the similar scores on exams, the Ft. Wayne campus did present some challenges and they were as follows: a) acceptance of the format; b) consistency in delivery of material, and c) ability to engage the student.

For the first lecture to ANSC101, the instructor visited the class and announced they would be receiving the class via videoconferencing and not by "traditional" classroom lecture. This news was a shock to students, since they were not aware the course had been changed from the past-history of traditional lecturing within the classroom. At this point, six students of 24 dropped the class and acknowledged they would wait until arriving on main campus to attend the like course, ANSC102. Thus, the remaining 18 students decided they would try the videoconferencing format coupled with the WebCt webpage. A large portion of the students, found the WebCt webpage to be challenging and unfriendly. Many of these students are commuters, so they connect to the Internet by modem, so downloading large files can be cumbersome and certain web browsers supplied by the computer manufactures do not recognize WebCt script. The download speed of specific pages was corrected on the main campus, so students would not have to download 5-plus mega-byte files (video clips), but rather supplied the information in class through the facilitator. Microsoft Internet Explorer, continuously gave students difficulty in viewing course material, since this browser does not recognize the WebCt format. In addition, explaining to students how to download a different browser, i.e., Netscape Communicator and

Table 1. Comparison of exam scores between the Purdue University main campus course (ANSC 102) and the Ft. Wayne branch campus course (ANSC 101).

| Course | Exam 1 | Exam 2 | Exam 3 | Overall Average |
|----------|-------------|-------------|------------|-----------------|
| ANSC 101 | 69.4 + 11.9 | 77.8 + 12.6 | 84 + 10.2 | 77.1 + 12.9 |
| ANSC 102 | 74.4 + 11.9 | 78.7 + 10.8 | 83.4 + 7.1 | 78.9 + 10.8 |

make it the default browser was equally challenging.

The consistency of delivery was extremely challenging during the first week of lecture and was terribly frustrating for both the students and instructor. Part of the frustration stems from Indiana, where major universities are making a concerted effort to equip branch campuses with high quality Internet technology media. In doing so, and being one of the first to use the "newer technology", the connection between campuses was a major challenge, but was soon fixed within the third week of class, where disruptions were infrequent. Because misconnections between campuses were anticipated, a backup plan had been design for such an event; that is, when a lecture was disrupted by failure to connect, a videotape was then created and mailed to the on-site facilitator for students to watch during the next class period. The idea was for students to gain the information asynchronously, so the instructor could proceed with the next lecture material, but this was not to be the case. More specifically, when students viewed lecture materials created on a videotape they would ask numerous questions the next time a

connection was made and the instructor had to literally redo the lecture. Therefore, as the semester progressed and when an interruption was experienced, class was canceled. Classes were canceled three times during the semester.

Originally the class at the Ft. Wayne campus was equipped with a 31" television for viewing classroom content. However, after some experimentation, it was decided to purchase a cable and transmit the signal into a modern projector and display the image on a pull down screen which was 4' x 4'. This simple change was well received by students in terms of increasing their ability to visualize slides. However, in order to properly showcase the image, the lighting had to be

Table 2 are required within the department, with questions 8 and 9 added to all evaluation sheets by the university. When comparing instructor performance as measured by student responses within Table 2, the scores were similar between ANSC101 and ANSC102. The similar scores as noted in the overall mean were surprising, since the ANSC101 course did experience various difficulties, while trying to receive/send signals. In addition to the instructor evaluations at Ft. Wayne, a series of university approved distance questions were asked to the ANSC101 students, see Table 3. In general, students taking ANSC 101 scored the DL format favorably, i.e., average score 3.7 out of 5.0.

Table 2. Questions proposed to students for the Purdue University main campus course (ANSC 102) and the Ft. Wayne branch campus course (ANSC 101) regarding the instructor

| Questions ¹ | ANSC 101 | ANSC 102 |
|---|----------|----------|
| 1. This course builds understanding of concepts and principles. | 4.6 | 4.6 |
| 2. My instructor seems well prepared for class. | 4.3 | 4.9 |
| 3. Students are encouraged to see the instructor if they are having difficulty. | 4.7 | 4.7 |
| 4. My instructor gives exams which accurately reflect the course material | 4.7 | 4.7 |
| 5. Cheating is a problem in this class. | 1.2 | 1.3 |
| 6. The climate of this class is conducive to learning. | 4.0 | 4.3 |
| 7. This course effectively challenges me to think. | 3.8 | 4.1 |
| 8. Overall, I would rate this course as: | 3.9 | 4.4 |
| 9. Overall, I would rate this instructor as: | 4.8 | 4.8 |
| Overall mean (Does not include Question 5) | 4.35 | 4.56 |

¹ Rating scale: Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2, and Strongly disagree = 1

Summary

The current paper demonstrates that DL has potential in effectively delivering instructional material. As shown in this paper, students taking ANSC 101 vs. those in ANSC 102 performed equally on exams, which is not surprising. It is anticipated that DL technologies will most likely become easier for future students, since they will not know life without the Internet, so the idea of learning/interacting at a distance will become a normal day-to-day activity for most students. Perhaps the biggest weakness of DL is the lack of feel an instructor can receive while teaching a course; that is, to visualize and see whether a student is grasping a concept or

dimmed in the receiving class such that the instructor had very little visual contact with students. It was sensed by both the instructor and facilitator that student/instructor interaction began to fall off.

talking or playing around with a classmate, or seems tentative.

Within the Department of Animal Sciences at Purdue University, the faculty has selected seven core questions, which need to be addressed following instruction. In addition to the seven questions required by the department, there are nearly 700 other types of questions to choose from within the university system. The first seven questions shown in

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Table 3. Questions proposed to students at the Ft. Wayne branch campus regarding distance learning format

| Questions ¹ | Response |
|--|----------|
| 1. This distance learning format is effective. | 3.2 |
| 2. My instructor is always considerate of distant students. | 4.6 |
| 3. The course makes excellent use of technology. | 3.6 |
| 4. The television component of this course is of good technical quality. | 3.7 |
| 5. The video signal is of good quality. | 3.6 |
| 6. Internet interaction between instructor and student is appropriate. | 3.6 |
| Overall Mean | 3.7 |

¹ Rating scale: Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2, and Strongly disagree = 1