THE EFFECTIVENESS OF VIDEOTAPED INSTRUCTION VERSUS ON-SITE INSTRUCTION IN A COURSE ENTITLED "ENGINEERING QUANTIFICATION OF BIOLOGICAL SYSTEMS"

By

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CHAPTER I

INTRODUCTION

The development of new information technologies and telecommunications has led to a growing interest in distance education. However, not all educators or students know or understand what distance education entails. So what exactly is distance education? Distance education is "any form of instruction in which the learner is physically separated from the instructor but is linked by some form of advanced technology that permits live, real-time interactive audio and/or video exchanges" (Barker & Hall, 1994, p. 126).

In order to stay current with curriculum changes, colleges and universities are searching for new efficient ways to educate students. Today, instructors must remain progressive with curriculum changes in order to instruct students on current information. However, there may not currently be sufficient expertise and/or student demand at some locations to develop and teach new courses using current technology. These colleges and universities often turn to videotaped instruction as an answer to these problems. Videotaped instruction appears to be used most often because it is easy to use and can be more cost efficient as compared to other more advanced forms of distance education. Often videotaped instruction is utilized, as it is more consistently available and standardized at most universities. In this way, information can be shared by instructors at remote sites throughout the United States.

According to Willis (1994), approximately forty-five states share distance education programming across state borders. In the spring of 1992, eleven universities in the United States offered distance education courses (King & Miller, 1994). A nation-wide survey by the Corporation for Public Broadcasting found 32 percent of responding colleges offered telecourses via videocassette (Clark & Verduin, 1991).

The International Council for Distance Education (ICDE) estimates about 10 million people study at a distance world wide every year (Clark and Verduin, 1991). Lewis (1985) discovered that videocassettes and audiocassettes were the most widely used form of media. Videobased technology can provide a medium that will allow universities to have an equitable share of the opportunities for programs, which other universities may not be able to provide. According to Brush and Brush (1986), approximately 8,500 for-profit and non-profit organizations in the United States spent $2.3 billion in 1985 to prepare videocassettes for use in training, promotion and communication. This indicates wide utilization of these technologies and further expansion is necessary.

Statement of the Problem

This study began as a means of evaluation of a new course taught via videotape. A team of four Agricultural Engineers were awarded a United States Department of Agriculture Challenge Grant, to integrate the new course with biological applications. The grant was designed to improve the curriculum of agricultural engineering related departments, in order to make the programs more biological in nature. No one individual

instructor had the expertise needed to instruct this new course. Therefore, universities used videotaped instruction as a means to utilize the experts in each field. This course was a new course created by the four instructors. They prepared the notes, homework and videotapes for the course.

Videotaped courses have become the primary delivery system for the College of Agriculture distance education program at Iowa State University due to the need of its' adult clientele, according to Miller & Honeyman (1993b). This may soon be true for the Departments of Agricultural Engineering and Biosystems at Clemson University, Oklahoma State University and the University of Florida.

The question "is videotaped instruction as effective as on-site instruction?" appeared unanswered as these three universities implemented the course. Videotaped instruction is an approach of the future, due to its affordability and ease of use. However research must be done to determine if videotaped instruction is as effective as the traditional on-site instruction.

Purpose and Objectives

The purpose of this study was to determine if videotaped instruction was an effective method of instruction as compared to on-site instruction in a new course entitled "Engineering Quantification of Biological Systems". The research objectives were as follows:

1. Describe demographic characteristics of students enrolled in the course.
2. Describe students' perceptions of the videotaped instructional method.

3. Describe instructors' perceptions of the videotaped instructional method.
4. Compare the students' academic achievement in the videotaped instruction with that of the on-site instruction.

Definition of Terms

As used in this study, the following terms are defined:

Distance education - A form of instruction in which the learner is physically separated from the instructor but is linked by some form of advanced technology that permits live, real-time interactive audio and video exchanges.

On-site instruction - A traditional classroom setting in which the teacher and students are both physically present.

Videobased technology - A one-way broadcast to be recorded and used at a later date.

Scope of the Study

The scope of the study included 16 students enrolled in a new Agricultural and Biosystems Engineering course entitled " Engineering Quantification of Biological Systems," offered simultaneously and team taught at Clemson University, Oklahoma State University, and the University of Florida in the Spring Semester of 1996.

CHAPTER II

REVIEW OF LITERATURE

Introduction

A review of related literature was conducted to become better acquainted with the numerous aspects of distance education, particularly videotaped instruction. A compilation of books, professional journals, and magazines was obtained to give a broad representation of the review of literature for this study. Chapter II has been divided into the following sections: 1) Agricultural Engineering to Biosystems Engineering, 2) Distance Education, and 3) Videotape Instruction. This information was presented to facilitate clarity, organization and understanding.

Agricultural Engineering to Biosystems Engineering

In the mid-1980's, enrollment in traditional Agricultural Engineering programs began to decrease to alarming levels. University Agricultural Engineering departments began to seriously examine their futures and determined that a primary uniqueness in agricultural engineering education was applying engineering principles to biological processes, especially those related to agriculture. Academic programs began to consciously change to reflect more of a biological orientation (USDA, 1994). These changes included departmental and program names, differences in accreditation criteria,

and development of new courses, all designed to develop a "biological engineering" thrust (USDA, 1994).

According to Buriak & Harper (1994), the mission statement for the curriculum in Agricultural Engineering, comprised by experts in the field of Agricultural Engineering states

> . . . the agricultural engineering curriculum should prepare professionals that are knowledgeable problem solvers able to integrate science, technology, and business within the complex agricultural, environmental, and human activity systems. The curriculum should include such areas as: the sciences, mathematics as a tool for problem solving, agriculture, technology, communications, systems thinking, leadership and interpersonal skills, ethics, management and decision making, marketing, team building and the environment, (p.18).

This definition lacked one component which should have been addressed: the quantification of biological processes. In order to keep up with technology, Agricultural Engineering had to add curriculum which is biological in nature. "In order to keep students in the program, Agricultural Engineering and Biosystems must keep up with the times. People don't find agriculture glamorous, so we must make it that way," (Mike Kiser, personal communication, March 20, 1996). In order for Agricultural Engineering and Biosystems to retain a competitive advantage, the adoption of appropriate technologies had to occur.

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The development of food technology and agricultural production systems has always been the realm of the agricultural engineer. As stated by Parrott et al. (1996), "this role is expanding to include new areas of expertise, many of which are collectively placed under biosystems engineering" (p. 8). The professional in agricultural engineering develops the necessary knowledge and skills in mathematics, biological, and physical sciences as they are applied to agricultural engineering systems to be an effective component in the transfer of new technology into food and fiber production, processing and service systems (Buriak & Harper, 1994).

New avenues for delivering instructional programs can help meet the educational and informational needs of contemporary society while justifying the existence of many agricultural institutions, organizations, courses and programs (Bowen & Jackson, 1993). Agricultural Engineering programs need to be continually updated to reflect current and emerging technology. Agricultural Engineering enhanced by biological training must create a biological systems engineer. As Agricultural Engineering becomes more biological in nature, more opportunities will become available. Emphasis on the environment is becoming more important and federal and state governments will be in need of engineers who have knowledge of biology to work in regulatory agencies, for environment cleanup, and for technical aides in research (Barfield et al., 1993).

Distance Education

Many people seemed to regard correspondence as something that took place entirely in hand writing; however, distance education was much more. Distance education

understand distance education programs, especially if they are involved in one. Attitudes toward distance education play an important role in who will use it and how or when it will be used (Clark & Verduin, 1991).

There are several criteria which should be measured to determine the quality of distance education. These criteria include "quality of learning materials, suitability of distance education to subject taught, provision of education versus instruction, and the intersubjectivity of learning at a distance" (Clark & Verduin ,1991, p. 106-107). When choosing a distance education delivery system, one must determine which method will be most effective for that particular situation. Most effective to some might mean cost, while to others, it might mean audience participation or large numbers of participants in the programs. However, no matter what the situation, the institution must consider whether the system they have chosen can reach its intended audience and provide better instruction than the traditional teacher (Schamber, 1988).

Distance education may become an important facet of the educational process in colleges and universities if it can win the support of campus faculty and administrators who often view distance education as inferior (Clark & Verduin, 1991). Many feel distance education would hinder their teaching methods, when in actuality it could enhance it, if proper methods were utilized. Unless their attitudes and perceptions change, it is unlikely that distance education will be accepted and utilized as a mainstream method of delivery in higher education. Although distance education is growing in importance, it is still largely conveyed through the continuing education and extension units of colleges and universities.

Videotaped Instruction

The use of videotaped instruction was expected to increase, yet, research was needed to develop and improve instructional strategies. "Research with a focus on improving specific distance education technologies such as videotape is in the mainstream of what is considered appropriate," state Honeyman & Miller (1993b, p. 141). The growing interest in the use of technology to deliver instruction increased the need for additional research on distance education technologies. Research was the ultimate key to learning more about videotaped instructional methods.

Videotape instruction has a number of advantages. In a study reported by Honeyman & Miller (1994), video-based instruction was helpful to students who were absent from class or wish to review a specific topic for clarification. The video offered flexibility by allowing utilization at a time convenient to the student and allowing the student to adjust the pace of the instruction. In many instances, higher quality material was available. Another factor many educators consider was whether it is cost efficient. Not only does videotape instruction share knowledge but shared costs often occur among the users (Willis, 1994).

Along with advantages came the disadvantages of videotape instruction. For a distance education student, the inability to raise a hand and ask the teacher to explain something he or she has not understood could impede the learning process. Therefore, distance education instructors have a responsibility for ensuring that the materials do not leave the students struggling (Perry, 1987).

Numerous studies have been done on videotaped instruction in the past. Many of these studies discussed recommendations that should be taken into consideration for future studies. One such study suggested instructors slow down the pace of the lessons to accommodate various student learning styles. While slowing down the pace of the lesson would decrease the amount of material presented, at the same time it would increase student learning. It has been suggested to not let the students become passive learners. Stopping the tape periodically and responding to questions will help to keep the students active in the classroom. The use of examples that relate to real-world application would also be beneficial to students. Instructors of videotaped courses must learn to be more than "talking heads," (Honeyman & Miller, 1994). The instructors need to become facilitators of the learning process. Another recommendation for the effectiveness of videotaped instruction was that of "manipulating the videotaped lesson to accommodate the attention span of the students" (Honeyman & Miller, 1994, p. 48). It is evident that videotaped instruction has not been perfected, however, neither has the traditional classroom setting. Educators have the responsibility to find ways to achieve that "perfect" state, in terms of distance education.

Summary

Distance education is an evolving approach to instruction. Distance education includes many methods. However, each individual institution has its own method which is the most effective for it. Yet, effectiveness must also include the instructors and their level of comfort with the distance education method. In order for it to be effective for the

students, it must be effective for the instructors. Clark & Verduin (1991), state that although the introduction of a new media system usually brings with it a "novelty effect.....media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition"(p. 88). It is the responsibility of colleges and universities to educate themselves about distance education. Distance educators who have developed research literature must continue to do so, in order to keep distance education in the forefront as an educational method of the future.

As Agricultural Engineering evolves into a more biological engineering program, videotape instruction may be employed. Along with the educational systems advancement of curriculum, opportunities for Agricultural Engineering and Biosystems students are rising. In order for these opportunities to continue to arise, the students must be properly educated. Distance education is an opportunity to achieve this intent, particularly through the use of videotaped instruction.

CHAPTER III

DESIGN AND METHODOLOGY

The purpose of this chapter was to describe the methods and procedures utilized in conducting this study. The intent of this study was to determine if videotaped instruction was an effective method of instruction as compared to on-site instruction in a course entitled "Engineering Quantification of Biological Systems."

Institutional Review Board

Federal regulations and Oklahoma State University policy require review and approval of all research studies that involve human subjects before investigators can initiate their research. The office of University Research at Oklahoma State University and the Institutional Review Board conducted the aforementioned review to protect the rights and welfare of human subjects involved in biomedical and behavioral research. In compliance with this policy, this study received the proper surveillance and was granted permission to continue. The Institutional Review Board approval code was AG-96-018.

Population

The population for this study consisted of 16 students enrolled in the "Engineering Quantification of Biological Systems" course offered simultaneously at Clemson University, Oklahoma State University, and the University of Florida in the Spring Semester 1996. The instructors and institutions have been coded to ensure confidentiality. Seven students were enrolled at Institution #2, five at Institution # 1, and four at the Institution # 3. This course was required of the students at Institution(s) #1 and #2, while it was an elective for the students at Institution # 3.

Situation

A course was created to share expertise in the areas of Agricultural Engineering and Biosystems Engineering. In order to share knowledge across the miles, videotaped instruction was to be utilized. Figure 1 illustrates the organizational plan of the course. This course was team taught three institutions via videotaped instruction. The students knew before they enrolled in the course that a) it was a new course, and b) videotaped instruction would be utilized. Thery were also told they would have a total of four instructors, one instructor each from Institution(s) # 1 and # 2 and two instructors from Institution # 3. Instructors' taught at their home site, where they videotaped each lecture (approximately 40-45 minutes). The videotapes were duplicated and sent to the other two schools for viewing. Two schools viewed one instructor live and three on videotape, while one school viewed all four instructors on videotape.

In an attempt to eliminate any bias in the grading system, the researcher assigned a random code to each student. The students' were coded using a random number table (Leedy, 1993).

Exam	Concept Areas Taught	Instructor	Delivery Mode By Institution
#1	Transport Phenomena	B	# 1 -- Taped # 2 -- Live # 3 -- Taped
# 2	Bioenergetics, Thermodynamics and Enzyme Kinetics	A	# 1 -- Live # 2 -- Taped # 3 -- Taped
#3	Metabolism Bioregulation	A C	# 1 -- Taped # 2 -- Taped # 3 -- Taped
Final Project	Agroecosystems Modeling	D	# 1 -- Taped # 2 -- Taped # 3 -- Taped

Figure 1. Diagram of the Organizational Plan for Teaching the Course

The instructor for each concept area graded the exams they created. The researcher acted as a distribution and collection point for the exams. The instructors sent a copy of each exam to the researcher who then prepared a copy of the exam for each student, put on a cover sheet, which included the student's name, instructor's name and the exam number on each exam and sent them to the instructors via Federal Express. After the students had taken the exams, the instructors Federal Expressed the exams back to the researcher. The researcher then put a different cover sheet on each exam that included only the student code number. The coded exams were then sent to the instructor

who developed the exam to grade. Once the exams were graded, the instructor sent the exams back to the researcher, who reattached the original cover sheet containing the students' names on the exams, and mailed the exams back to the proper instructor by way of Federal Express. This process was followed for the first three exams. The researcher kept a record of each student's exam scores in order to make a comparison at the end of the course.

The students' test scores were compared according to whether they received the material over which they were tested from videotape or through an on-site instructor. The purpose of this was to determine if there was a significant difference in test scores depending on the method of instruction as stated in objective four.

Design of the Instrument

The researcher developed two questionnaires in order to ascertain the students' perceptions of the course. One was given at mid-semester (Appendix A) while the second or final evaluation (Appendix B) was given at the end of the semester. The purpose of the questionnaires were to evaluate the instructors and to determine the students' overall views of videotaped instruction.

After conducting a review of literature including studies conducted by Honeyman and Miller (1993,1994) and Dooley and Gruele (1994), questions for the instrument were developed by the researcher. The questionnaire was reviewed and revised by a panel of experts consisting of faculty from the department of Agricultural Education, Communications and 4-H Youth Development. Revisions were also made by

recommendations from a panel of graduate students enrolled in the research design course at Oklahoma State University.

The mid-semester instrument was developed to assess the perceptions of the students concerning videotaped instruction versus on-site instruction. The twenty-three item instrument consisted of sections relating to the course. Section I of the instrument included three questions designed to obtain demographic information about the students in the course. Section II of the evaluation consisted of yes or no questions having to do with the videotaped presentation of the course. Sections III and IV included six questions pertaining to the first two individual instructors' performance. The students evaluated instructors based on whether they viewed a taped presentation or had received a live presentation. A four point "Likert-type" scale (1 = "Excellent," 2 = "Good," 3 = "Fair," 4 = "Poor") was utilized for these forced responses for each individual instructors' presentation. Additionally, students were asked to respond to three questions pertaining to likes and dislikes of the course as well as suggestions for the course thus far.

The final instrument was developed to obtain similar information as the mid-semester instrument. However, the final instrument differed from the mid-semester instrument in that it did not ask demographic data and asked the students' overall perception of the course. The final instrument consisted of twenty-nine questions relating to the course. Section I of the instrument included two yes or no questions pertaining to the videotaped presentation of the course. Sections II and III included six questions having to do with the last two individual instructors' performance. The students, again, evaluated the final two instructors on whether they were viewed by a taped presentation

or a live presentation. Section IV of the instrument included eight questions relating to the overall evaluation of the course. Again, a four point "Likert-type" scale (1 = "Excellent," 2 = "Good," 3 = "Fair," 4 = "Poor") was utilized for those forced responses. There were also three additional forced response questions, which asked specifically about the "delivery of content, frequency of examinations, and their enthusiasm level for taking another course utilizing videotape." One additional yes or no question was asked pertaining to the concepts taught in the course. The students were also asked to respond to three open ended questions pertaining to their likes and dislikes of the course as well as suggestions for the course.

A case study approach was used to gather date on individual instructors perceptions of the effectiveness of the course. Each instructor was personally interviewed by the researcher. The interviews ranged from 20 minutes to 40 minutes in length. Each instructor was asked a set of questions pertaining to the course. The researcher used a tape recorder to collect the responses given by each instructor.

Data Analysis

Data yielded by the respondents were compiled and evaluated using descriptive statistics. Descriptive statistics included calculated means, frequency distributions, percentages and standard deviation. The t-test for statistical significance was used to test for significant difference in the students' exam scores whether viewed via videotape or live instruction. Significance was set at alpha = 0.05.

To permit statistical treatment of the data collected with those questions dealing with each individual instructors performance and the overall rating of the course, numerical values were assigned to the importance categories so that the mean could be calculated. The following pattern was developed to permit categorization and interpretation of the calculated means: 1.00-1.50 = Excellent, 1.51-2.50 = Good, 2.51-3.50 = Fair, and 3.51-4.00 = Poor.

CHAPTER IV

FINDINGS

The purpose of this study was to determine if videotaped instruction was an effective method of instruction as compared to on-site instruction in a course entitled "Engineering Quantification of Biological Systems." The findings are organized around the research objectives.

Findings Related to Objective One

Table I illustrates demographic data obtained from the 15 students responding on the mid-semester evaluation. A majority of the students (46.68%) were from Institution #2. The population was 80% male. Approximately 66.67% (10) of the students were seniors, indicating this to be an upper level course. All the students had a discipline of Agricultural and Biological Engineering. It was revealed that only 26.66% (4) of the students had taken a course utilizing videotaped instruction prior to this course. The other 11 (73.34%) students had no previous experience with videotaped instruction. There was one non-respondent on the mid-semester evaluation.

TABLE I

DEMOGRAPHIC CHARACTERISTICS
OF THE STUDENTS

CHARACTERISTICS	N	%
INSTITUTION		
Institution 1	4	26.66
Institution 2	7	46.68
Institution 3	4	26.66
GENDER		
Male	12	80.00
Female	3	20.00
CLASSIFICATION		
Freshman	0	0.00
Sophomore	0	0.00
Junior	4	26.66
Senior	10	66.67
Graduate	1	6.67

As can be determined from Table II, in the first half of the course, 60% of the students watched the videotape in the classroom without stopping. In instances where the videotape was stopped, 100.00% of the students indicated this was done "to discuss or clarify points." In the final half of the course, half (50.00%) of the students stated the videotape was stopped while watching it in class. When the videotape was stopped in class, 100.00% of the students indicated this was done to "discuss or clarify points." All respondents indicated the videotapes were available for individual checkout. Of the students who checked out the videotapes in the first half of the course, 50.00% watched

the videotapes "within that week." Of the students who checked out videotapes in the final half of the course, three responses yielded a percentage of 14.28%. Those responses were "the next day," "within the week," and "not at all."

TABLE II

VIDEOTAPE USAGE IN AND OUT OF THE CLASSROOM

TYPES OF USAGE		MID-SEMESTER N	%	FINAL N	%
While in class, did you watch the videotapes without stopping?	YES	9	60.00	7	50.00
	NO	6	40.00	7	50.00
If NO, why was the videotape stopped?					
	To discuss or clarify points	6	100.00	7	100.00
	To replay a specific segment	0	0.00	0	0.00
Were the videotapes available for checkout?					
	YES	15	100.00		
	NO	0	0.00		
Did you check out any of the videotapes?					
	YES	8	53.33		
	NO	7	46.67		
If YES, when did you view the videotape?					
	Immediately	2	25.00	1	7.14
	The next day	1	12.50	2	14.28
	Within the week	4	50.00	2	14.28
	Not at all	1	12.50	2	14.28

Findings Related to Objective Two

The results depicted in Tables III - VI were of evaluations of the videotaped presentations. The instructors were evaluated on six performance factors, using a scale of 1 = "Excellent," 2 = "Good," 3 = "Fair," 4 = "Poor." Those factors were: Enthusiasm, Preparation, Organization, Explanation of Concepts, Quality of Notes Provided and the Overall Rating of the Instructor. The results were tabulated and given a rating according to the mean rating. The scale was as follows: 1.00-1.50 = "Excellent," 1.51-2.50 = "Good," 2.51-3.50 = "Fair," 3.51-4.00 = "Poor."

Table III addresses data provided by students for Instructor A. There were two factors on which the instructor received a rating of "Excellent." The first was Organization with a mean of 1.27, and the second was Preparation, receiving a mean of 1.36. This particular instructor received a rating of "Good" on all the remaining factors. It should be noted there were no ratings below "Fair" were given to this particular instructor on any of the comparison factors.

TABLE III

STUDENTS' PERCEPTIONS OF PERFORMANCE FACTORS OF VIDEOTAPED PRESENTATIONS BY INSTRUCTOR "A"

FACTOR	EXCELLENT		GOOD		FAIR		POOR		MEAN	RATING
	N	%	N	%	N	%	N	%		
Organization	8	72.73	3	27.27	0	0.00	0	0.00	1.27	Excellent
Preparation	8	72.73	2	18.18	1	9.09	0	0.00	1.36	Excellent
Quality notes provided	5	45.45	6	54.55	0	0.00	0	0.00	1.54	Good
Overall rating of instructor	4	36.36	7	63.64	0	0.00	0	0.00	1.63	Good
Enthusiasm	2	18.18	6	54.55	3	27.27	0	0.00	2.09	Good
Explanation of concepts	2	18.18	6	54.55	3	27.27	0	0.00	2.09	Good

Table IV was developed to present data provided by students for Instructor B. This instructor received a rating of "Good" on all the performance factors. There were, however, three factors in which the mean rating was noticeably higher for this person. The highest rating was given for the factor of Organization. It had a mean of 1.62. Overall Rating of Instructor had a mean of 1.75, while Preparation had a mean of 1.88. On only two factors was a rating of "Poor" assigned. Those were Explanation of Concepts and Quality of Notes Provided. One student selected this response on each of those items.

TABLE IV

STUDENTS' PERCEPTIONS OF PERFORMANCE FACTORS OF VIDEOTAPED PRESENTATIONS BY INSTRUCTOR "B"

FACTOR	EXCELLENT		GOOD		FAIR		POOR		MEAN	RATING
	N	%	N	%	N	%	N	%		
Organization	3	37.50	2	25.00	3	37.50	0	0.00	1.62	Good
Overall rating of instructor	3	37.50	4	50.00	1	12.50	0	0.00	1.75	Good
Preparation	2	25.00	5	62.50	1	12.50	0	0.00	1.88	Good
Enthusiasm	1	12.50	6	75.00	1	12.50	0	0.00	2.00	Good
Explanation of concepts	2	25.00	3	37.50	2	25.00	1	12.5	2.25	Good
Quality notes provide	3	37.50	1	12.50	3	37.50	1	12.50	2.25	Good

The data in Table V represents the data provided by students for Instructor C. This particular instructors highest mean was for the Overall Rating of Instructor factor. It was 2.20 with a rating of "Good." All the other factors had a rating of "Good," except for in the area of Explanation of Concepts which received a rating of "Fair."

TABLE V

STUDENTS' PERCEPTIONS OF PERFORMANCE FACTORS OF VIDEOTAPED PRESENTATIONS BY INSTRUCTOR "C"

FACTOR	EXCELLENT		GOOD		FAIR		POOR		MEAN	RATING
	N	%	N	%	N	%	N	%		
Preparation	5	35.71	5	35.71	3	21.43	1	7.15	2.00	Good
Overall rating of instructor	2	14.29	7	50.00	4	28.57	1	7.14	2.28	Good
Enthusiasm	2	14.29	6	42.86	5	35.71	1	7.14	2.35	Good
Organization	4	28.57	4	28.57	2	14.29	4	28.57	2.42	Good
Quality notes provided	3	21.43	4	28.57	4	28.57	3	21.43	2.50	Good
Explanation of concepts	1	7.14	7	50.00	3	21.43	3	21.43	2.57	Fair

Table VI illustrated data provided by students for Instructor D. This instructor received ratings of "Good" on all the performance factors. The highest mean was 1.57 while the lowest was 2.21. This instructor did receive three individual "Poor" ratings. Again, this did not affect the overall rating of "Good" which the instructor received.

TABLE VI

STUDENTS' PERCEPTIONS OF PERFORMANCE FACTORS OF VIDEOTAPED PRESENTATIONS BY INSTRUCTOR "D"

FACTOR	EXCELLENT		GOOD		FAIR		POOR		MEAN	RATING
	N	%	N	%	N	%	N	%		
Preparation	8	57.14	4	28.57	2	14.29	0	0.00	1.57	Good
Enthusiasm	4	28.57	9	64.29	1	7.14	0	0.00	1.78	Good
Overall rating of instructor	4	28.57	9	64.29	1	7.14	0	0.00	1.78	Good
Organization	5	35.71	7	50.00	2	14.29	0	0.00	1.78	Good
Quality notes provided	4	28.57	8	57.15	1	7.14	1	7.14	1.92	Good
Explanation of concepts	2	14.29	9	64.29	1	7.14	2	14.28	2.21	Good

Table VII is a display of data associated with the students' overall perceptions of selected aspects of the course. The students were asked three forced response questions. Two of the questions used choices of "too quickly," "about right," and "too slowly." The final question in this section had answer choices of "very enthusiastic," "somewhat enthusiastic" " somewhat unenthusiastic," and "very unenthusiastic." The majority of the students (75.00%) felt the delivery of content was "about right." Most of the students

(92.31%) confirmed the frequency of examinations to be "about right." Although there was one student who felt there were "too few" examinations. When asked if they would be enthused about taking another videotaped course, half of the students (50.00%) stated they were "somewhat unenthusiastic," while 35.71% stated they would be "somewhat enthusiastic."

TABLE VII

STUDENT'S OVERALL PERCEPTION OF SELECTED ASPECTS THE COURSE

COMPARISON FACTOR		N	%
Delivery of content	(N = 12)		
	Too quickly	2	16.67
	About right	9	75.00
	Too slow	1	8.33
Frequency of examinations	(N = 13)		
	Too few	1	7.69
	About right	12	92.31
	Too many	0	0.00
Are concepts taught applicable to real world problems or situations?	(N = 13)		
	Yes	11	84.62
	No	2	15.38
Are you enthused about taking another course by videotaped instruction?	(N = 14)		
	Very enthusiastic	0	0.00
	Somewhat enthusiastic	5	35.71
	Somewhat unenthusiastic	7	50.00
	Very unenthusiastic	2	14.29

Table VIII illustrated the students' overall perceptions of the course. The course was evaluated on eight factors using a scale of 1 = "Excellent," 2 = "Good," 3 = "Fair,"

and 4 = "Poor." Those factors were: Fairness in Grading, Value of Course, Difficulty of Course, Examinations, Work Demanded, Enjoyment, Frequency of Exams, and Assignments. The results were tabulated and given a rating according to the mean rating. The scale was as follows: 1:00-1.50 = "Excellent," 1.51-2.50 = "Good," 2.51-3.50 = "Fair," and 3.51-4.00 = "Poor." All of the factors received a rating of "Good" with the exception of Assignments which had a mean of 2.57, indicating a "Poor" rating. The comparison factor which had the highest rating was Fairness in Grading It had a mean of 1.92. Value of course and Difficulty of Course both had means of 2.14.

TABLE VIII

STUDENTS' PERCEPTIONS OF SELECTED PERFORMANCE FACTORS OF THE COURSE

FACTOR	EXCELLENT		GOOD		FAIR		POOR		MEAN	RATING
	N	%	N	%	N	%	N	%		
Fairness in Grading	1	7.14	11	78.57	2	14.29	0	0.00	1.92	Good
Value of Course	4	28.57	5	35.71	3	21.43	2	14.29	2.14	Good
Difficulty of Course	2	14.29	8	57.14	4	28.57	0	0.00	2.14	Good
Examinations	2	14.29	8	57.14	3	21.43	1	7.14	2.21	Good
Work Demand	1	7.14	8	57.14	3	21.43	2	14.29	2.42	Good
Enjoyment	2	14.29	6	42.85	4	28.57	2	14.29	2.42	Good
Frequency of Exams	2	14.29	5	35.71	5	35.71	2	14.29	2.50	Good
Assignments	0	0.00	8	57.14	4	28.57	2	14.29	2.57	Fair

The students were asked three open-ended questions. These questions dealt with the students' likes, dislikes, and suggestions for the course. Students' comments are recorded in Appendix C. The comments fell into several different categories depending on the nature of the comment.

The "likes" were divided into six categories: notes, videotape, course structure, instructors, course material and review sessions. Six of the students commented on the notes of the course. Some of the students commented on the notes as "clear and complete," "very helpful," and "were equivalent to a text book." There were five comments made about the videotape portion of the course, such as "video enhanced visual aids and notes," and "I liked the fact that I could check out a tape if I missed class." The students stated that the course structure was "a broad summary of knowledge." The instructor category received five comments. Examples of those are "the classroom instructor could answer questions about the videos," "the best part was having professors who are considered experts in their fields teach on that particular topic or section of the course," and " the interaction between the students and professors watching the course, I feel I have four professors." The students comments about the course material were as follows: "material was interesting," and "topics are not too specific."

Responses to the "dislikes" category were similar to those of the "likes" category. The categories were derivations, time, instructors, exams, notes, videotape and course structure. The students' perceptions of the videotapes were "boring," "sometimes difficult to tune into the video," "watching a taped lecture got very redundant by the end of the course," and "tend to slide away or lose concentration during the 50 minute class." In

terms of what the students disliked about the exams, they stated " we have to wait three or four weeks to get a test back, are ready to see what we made and have to wait on other classes to see what we made." The students perceived the derivations as " too much equation breakdown that you tend to lose focus," and "too much derivation of formulas and laws." The students stated that notes were "not well organized," and "did not follow the instructors exactly." In terms of the course structure, the students felt " a lot of material seemed to be just thrown together without explanation of why it was relevant." The students also disliked "having to meet an extra time to learn what on the videotape," and the fact that "there was not enough time to view the videotapes and discuss them."

The students were asked what suggestions they had to improve the course. Again the students' comments fell into several different categories. Those categories were examples, videotape, equations, notes, interaction, exams, homework, course structure and instructors. The videotape category received five comments. The students' suggestions for the videotape were "make lectures on video at a faster pace," "make the number of videotapes equal to number of times class meets, taking into consideration discussion in the length of each presentation," and " have the instructor stop the tape every 15-20 minutes to explain something, this will get the class's attention." "Have more examples in the book," and "many examples and discussions were too drawn out," were the students comments on the examples category. The students also made comments on the interaction in the course. The students suggested " more interaction with students,' and "videotapes should be made shorter, this would allow for the instructor to answer questions and give input." The category of course structure received four comments.

Examples of those comments are "make it all a little more organized," "given the intent of the course, I think it is going well." In terms of the instructors, the students felt "instructors define the purpose better and how the given subject fits into the big picture, maybe some more focus could be put on the point of it all and less on derivations." "Highlighting main points or ideas in the notes" was suggested by one student, while another stated "it would make the class less boring if the class notes handed out weren't as complete, this way students must pay more attention and add to the notes as they were watch the lectures." Comments about the equations included " cut down on mathematical derivations," "perhaps the derivations could be supplied in the notes and talked about briefly in the presentations."

Both of the evaluations had several sections for additional comment from the students. Again the comments fell into several categories. The categories were exams, time, homework, course structure and miscellaneous. The time category had the most comments. The students stated "this course tried to cover way too much material for the time allowed," "when you are so pressed for time that the instructor can go through 125 overheads in fifty minutes, something is wrong," and "out of class time had to be spent because of too much material being covered."

Findings Related to Objective Three

In order to describe the instructors' perceptions of the videotaped portion of the course, each of them was interviewed one on one with the researcher. Each instructor was asked four open ended questions. The questions were "what worked well for the

course?," "what didn't work well for the course?," "what suggestions do you have for the course?," and "would you be willing to teach a course utilizing videotaped instruction again?" All of the instructors comments are listed in Appendix D.

The instructors basically all felt the same in terms of what worked well for the course. They felt a positive aspect for the course was having "a number of people with different expertise," "good notes," and "good attempt at overall communication of instructors." The availability of the videotapes was also something that worked well for the instructors.

The instructors noted several aspects of the course which they didn't like. Some of those included "information limited to notes and lectures," "lectures too long for a 50 minute period, need more discussion time," "difficulty communicating with the students," and "need more assignments." Some of the instructors felt there was an "imbalance of instruction."

The instructors were very open in terms of suggestions for the future of the course. Many of the suggestions included shortening the videotapes to under 30 minutes, which would leave time for discussion and questions, more assignments in order to learn the "need to know," and having questions and objectives for each lecture. The instructors felt the students also needed more outside readings. All of the instructors answered "yes" to the question of "would you teach a videotaped instructional course again?"

Findings Related to Objective Four

Table IX illustrates the mean exam scores for each institution. Material covered on exam one was viewed live by students at Institution # 2, while material covered on exam two was viewed live by students at Institution # 1. Scores for exam three and the final project are included in Table IX, however they are not included in the comparisons of student exam scores. Material covered by exam three and the final project were all taught by videotape at all three institutions.

TABLE IX

MEAN EXAM SCORES FOR EACH INSTITUTION BY EXAM

CHARACTERISTICS	MODE OF DELIVERY	MEAN
Exam 1		
Institution 1	Taped	74.40
Institution 2	Live	80.14
Institution 3	Taped	85.75
Exam 2		
Institution 1	Live	86.70
Institution 2	Taped	88.93
Institution 3	Taped	88.50
Exam 3		
Institution 1	Taped	67.80
Institution 2	Taped	78.43
Institution 3	Taped	70.00
Final Project		
Institution 1	Taped	81.00
Institution 2	Taped	99.29
Institution 3	Taped	86.50

There was no significant difference in the videotaped exam scores and the live exam scores. Exam one's mean score taped was derived from Institution(s) # 1 and 3 students exam scores. While exam two's mean score was comprised of Institution(s) #2 and # 3 students exam scores. This was illustrated in Table X, where it was determined that the t-value for exam one was .07 (p = .94) and was not significant at the .05 level. Exam two also showed no significant difference in the exam scores. The t-value for exam two was -.29 (p = .78) and was not significant at the .05 level.

TABLE X

A T-TEST COMPARISON OF VIDEOTAPED AND ON-SITE INSTRUCTIONAL METHODS OF ACADEMIC ACHIEVEMENTS BY STUDENTS

		N	MEAN	S.D.	T-VALUE	P
Exam 1	Live	7	80.14	13.83	0.07	0.94
	Taped	9	79.44	24.27		
Exam 2	Live	5	86.70	15.16	0.29	0.78
	Taped	11	88.77	6.89		

Figure 2. compares the academic achievements of the students exam scores based on viewing the lecture via videotape or live.

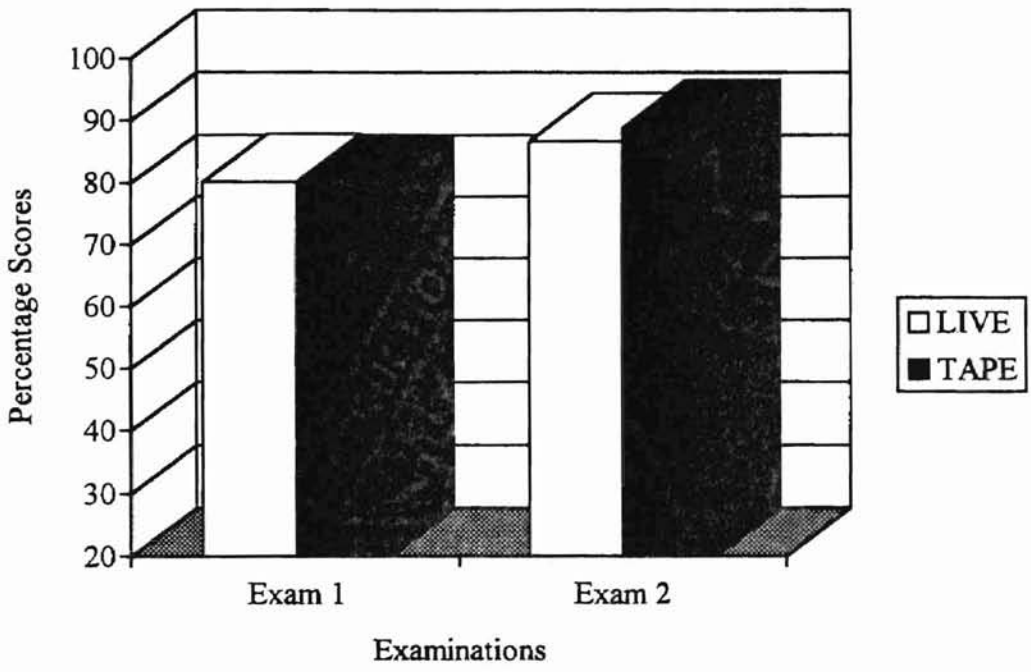

Figure 2. Academic Achievements of Students Exam Scores

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this chapter was to present a review and summary of this study. Findings, conclusions and recommendations are based on an analysis and interpretation of the data presented.

Purpose of the Study

The purpose of this study was to determine if videotaped instruction is an effective method of instruction as compared to on-site instruction in a course entitled "Engineering Quantification of Biological Systems".

Objectives of the Study

To accomplish the major purpose of this study, the following objectives were developed:

1) Determine demographic characteristics of students enrolled in the course.
2) Describe students' perceptions of the videotaped instructional method.
3) Describe instructors' perceptions of the videotaped instructional method.

4) Compare the student's academic achievement in the videotaped instruction with the on-site instruction.

Population of the Study

The population of the study included 16 students enrolled in the Agricultural and Biosystems Engineering course entitled "Engineering Quantification of Biological Systems."

Major Findings of the Study

Objective One: Demographic Information

Sixteen students from three different universities comprised the population for this study. Five students were from Institution # 1, seven students from Institution # 2 and four students were from the Institution # 3. Approximately 66.67% (10) of the students were seniors, indicating this to be an upper level course. The population was 80% male, with 12 males and three females. All the students had a discipline of Agricultural and Biological Engineering. Fifteen out of the sixteen questionnaires were returned.

Objective Two: Students' Perceptions of Videotaped Instruction

There were two questionnaires developed to ascertain the students perceptions. The students evaluated all four instructors on their performance of instruction whether it be live or videotaped. Table XI addressed the data provided from the students' perceptions of the individual instructor's videotaped presentations as well as the combined

mean for the videotaped presentation. Five of the six factors received a rating of "Fair." There was one "Poor" rating given to the factor of Explanation of Concepts.

TABLE XI

A COMPARISON OF INDIVIDUAL INSTRUCTORS VIDEOTAPED PRESENTATION MEANS TO THE COMBINED VIDEOTAPED PRESENTATIONS MEAN FOR SELECTED ASPECTS OF THE COURSE

FACTOR	INDIVIDUAL INSTRUCTOR MEANS				MEAN	RATING
	A	B	C	D		
Preparation	1.36	1.88	2.00	1.57	1.70	Good
Organization	1.27	1.62	2.42	1.78	1.77	Good
Overall Rating of Instructor	1.63	1.75	2.28	1.78	1.86	Good
Quality notes Provided	1.54	2.25	2.50	1.92	2.05	Good
Enthusiasm	2.09	2.00	2.35	1.78	2.06	Good
Explanation of Concepts	2.09	2.25	2.57	2.21	2.28	Good

There were three open-ended questions on the two instruments. The questions pertained to the likes and dislikes of the course as well as suggestions for the course. The students' comments fell into five different categories of "likes" question: notes, videotape, course structure, course material, instructors and review sessions. The "dislikes" of the course included categories of derivations, exams, notes, time, instructors, course structure and videotape. The students' suggestions to improve the course fell into these categories:

examples, exams, homework, videotape, equations, notes, interaction, course structure and instructors.

Objective Three: Instructors' Perceptions of Videotaped Instruction

Personal interviews were conducted with each of the instructors by the researcher in order to determine the instructors perceptions of the course. The instructors were each asked a series of questions pertaining to what worked well and didn't work well for the course, suggestions to improve the course and if they would be willing to instruct a videotaped course in the future.

The instructors essentially all felt the same in terms of what worked well for the course. The instructors noted several aspects of the course which they didn't like. One instructor summed up the course with the statement "not a perfect system despite the best attempts." The instructors were very open in terms of suggestions for the future of the course. All of the instructors answered "yes" to the question of would you teach a videotaped instructional course again?"

Objective Four: Comparison of Academic Achievements by Students

Exam one viewed had a t-test value of .07 ($p = .94$) indicating no significant difference was found at the alpha = .05 level. Exam two showed a t-value of -.29 ($p = .78$), and again there was no significant difference at the .05 level of significance.

Conclusions

Based on the findings of this study the general conclusions of the study were:

1. The students in the course were senior, males studying Agricultural and Biological Engineering.

2. The availability of the videotapes for check out, a variety of instructors and having an instructor in the classroom to answer any questions worked well for the course.

3. The videotapes were too long.

4. There were too many equations and/or derivations worked in class and not enough for the students to work themselves.

5. Students and faculty liked having notes prepared for the students. This gave the students the chance to watch the video and not concentrate solely on taking notes.

6. The exams were concentrated in the final half of the course, leaving very little time between the exams.

7. There was little communication between students and instructors at remote sites.

8. In terms of academic achievement videotaped instruction is as effective as live on-site instruction according to the students' exam scores in this study.

9. Students have positive perceptions toward videotape instruction.

Recommendations

The following recommendations were based on the findings of this study and the conclusions that were reached:

1. When videotaping a lecture, the instructor should keep it under 30 minutes. This would allow for discussion or questions during a 50 minute class period.

2. The instructors should limit the amount of equations and/or derivations worked in one class period. More example problems should be in the notes for the students to work themselves.

3. The notes should coincide more with the videotape. This eliminates the students searching for the correct page while the videotape is playing.

4. The exams should be spaced more evenly throughout the course. This would help to keep each student more updated on his/her grade in the course.

5. Communication should be increased between the students and the instructors at remote sites. This would clarify questions the students have about assignments or lectures from other instructors.

6. This course should be taught by videotaped instruction in the future, as it was an effective method of instruction.

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APPENDIXES

APPENDIX A

MID-SEMESTER EVALUATION

Engineering Quantification of Biological Systems

Mid-Semester Evaluation

CLEMSON UNIVERSITY

UNIVERSITY OF FLORIDA

OSU BIOSYSTEMS ENGINEERING

INSTRUCTIONS

This is a mid-semester evaluation of the course. The evaluations will help to determine if the videotaped lectures are an effective method of instruction. Your comments should be reflective specifically of the videotaped or live presentations. This is not an overall evaluation of the course. All comments are appreciated. Survey responses will be kept confidential. Please tear off cover sheet with your name before returning the evaluation to your instructor.

DEMOGRAPHICS

Gender:

Male _____
Female _____

Classification:

Freshman ____
Sophomore ____
Junior ____
Senior ____
Graduate ____

Major:_____

COMMENTS

What do you like best about the course?

What do you like least about the course?

What suggestions do you have to improve the course?

ADDITIONAL COMMENTS

Instructions: Please answer the questions in relation to the videotaped or live presentation segment of the course.

THE VIDEOTAPED PRESENTATION

Have you taken a course utilizing videotaped lectures before? Yes___ No____

On what days and at what time does this class meet?_____

While in class, did you watch the videos without stopping? Yes___ No____

If no, why was the video stopped?

To discuss or clarify points ____
To replay a specific segment ____
Other (list)_____

Were the videotapes available for check out? Yes___ No____

If yes, did you check out and view any videotape on your own? Yes___ No____

If you checked out a videotape, when did you view the tape?

Immediately ___
The next day ___
Within the week ___
Not at all ___

Instructions: Please answer the following questions according to each instructors performance. Mark whether the instructor was on video or live. Your comments should be reflective specifically of the videotaped or live presentations. This is NOT an overall evaluation of the course.

THE INSTRUCTOR

Barfield____
Taped Presentation_____Live Presentation_____

Rate the instructor according to the following:
1 = Excellent 2 = Good 3 = Fair 4 = Poor

Enthusiasm	1	2	3	4
Preparation	1	2	3	4
Organization	1	2	3	4
Explanation of concepts	1	2	3	4
Quality notes provided	1	2	3	4
Overall rating of instructor	1	2	3	4

Did the instructor use:

Supplemental videos	Yes____	No____
Models	Yes____	No____
Visuals	Yes____	No____
Examples	Yes____	No____

ADDITIONAL COMMENTS:

Engineering Quantification of Biological Systems

Mid-Semester Evaluation

CLEMSON UNIVERSITY

UNIVERSITY OF FLORIDA

OSU BIOSYSTEMS ENGINEERING

Instructions: Please answer the following questions according to each instructors performance. Mark whether the instructor was on video or live. Your comments should be reflective specifically of the videotaped or live presentations. _This is NOT an overall evaluation of the course.

THE INSTRUCTOR

Young____
Taped Presentation____ Live Presentation____

Rate the instructor according to the following:
1 = Excellent 2 = Good 3 = Fair 4 = Poor

Enthusiasm	1	2	3	4
Preparation	1	2	3	4
Organization	1	2	3	4
Explanation of concepts	1	2	3	4
Quality notes provided	1	2	3	4
Overall rating of instructor	1	2	3	4

Did the instructor use:

Supplemental videos	Yes____	No____
Models	Yes____	No____
Visuals	Yes____	No____
Examples	Yes____	No____

ADDITIONAL COMMENTS:

Ms. Amy Atherton
Graduate Research Assistant

Department of Agricultural Education,
Communications, and 4-H Youth Development
Oklahoma State University

APPENDIX B

FINAL EVALUATION

INSTRUCTIONS

This is a final evaluation of the course. Your comments should be reflective specifically of the videotaped or live presentations. Survey responses will be kept confidential. Please tear off cover sheet with your name before returning the evaluation to your instructor.

THE VIDEOTAPED PRESENTATION

In the second half of the course:
While in class, did you watch the videos
without stopping? Yes___ No____

If no, why was the video stopped?
To discuss or clarify points ____
To replay a specific segment ____
Other (list)_____

If you checked out a videotape, when did you view the tape?
Immediately ___
The next day ___
Within the week ___
Not at all ___

YOUR ON-SITE INSTRUCTOR

In the second half of the course:
Did the instructor encourage discussion or
participation while watching the video? Yes____ No____

Was the instructor prepared to discuss the material
covered on the videotape? Yes____ No____

Was the instructor enthused about facilitating? Yes____ No____

Was there one on one instruction? Yes____ No____

Was help given outside of class? Yes____ No____

Instructions: Please answer the following questions according to each instructors performance. Mark whether the instructor was on video or live. Your comments should be reflective specifically of the videotaped or live presentations.

THE INSTRUCTOR

Chynoweth____
Taped Presentation_____Live Presentation_____

Rate the instructor according to the following:

	Excellent	Good	Fair	Poor
Enthusiasm	1	2	3	4
Preparation	1	2	3	4
Organization	1	2	3	4
Explanation of concepts	1	2	3	4
Quality notes provided	1	2	3	4
Overall rating of instructor	1	2	3	4

Did the instructor use:

Supplemental videos	Yes____	No____
Models	Yes____	No____
Visuals	Yes____	No____
Examples	Yes____	No____

ADDITIONAL COMMENTS:

Instructions: Please answer the following questions according to each instructors performance. Mark whether the instructor was on video or live. Your comments should be reflective specifically of the videotaped or live presentations.

THE INSTRUCTOR

Loewer____
Taped Presentation____ Live Presentation____

Rate the instructor according to the following:

	Excellent	Good	Fair	Poor
Enthusiasm	1	2	3	4
Preparation	1	2	3	4
Organization	1	2	3	4
Explanation of concepts	1	2	3	4
Quality notes provided	1	2	3	4
Overall rating of instructor	1	2	3	4

Did the instructor use:

Supplemental videos	Yes____	No____
Models	Yes____	No____
Visuals	Yes____	No____
Examples	Yes____	No____

ADDITIONAL COMMENTS:

Instructions: Please answer all questions according to the overall nature of the course. This is an overall evaluation of the course. This will include all four professors.

OVERALL EVALUATION OF THE COURSE

Rate the overall evaluation of the course according to the following:

	Excellent	Good	Fair	Poor
Assignments	1	2	3	4
Examinations	1	2	3	4
Fairness in grading	1	2	3	4
Work demanded	1	2	3	4
Frequency of examinations	1	2	3	4
Enjoyment	1	2	3	4
Value of course	1	2	3	4
Difficulty of course	1	2	3	4

ADDITIONAL COMMENTS:

Rate the course according to the following:

Delivery of content
___ too quickly
___ about right
___ too slowly

Frequency of examinations
___ too few
___ about right
___ too many

Are the concepts taught applicable to real world problems or situations? Yes____ No____

Now that you have completed a course by videotaped instruction, how enthused would you be about taking another course by videotaped instruction? Circle one.

___ very enthusiastic
___ somewhat enthusiastic
___ somewhat unenthusiastic
___ very unenthusiastic

COMMENTS

What do you like best about the course?

What do you like least about the course?

What suggestions do you have to improve the course?

ADDITIONAL COMMENTS

Ms. Amy Atherton
Graduate Research Assistant

Department of Agricultural Education,
Communications, and 4-H Youth Development
Oklahoma State University

APPENDIX C

STUDENTS' COMMENTS

Student Comments

(All the comments listed below are direct quotes from the students involved in the study.)

What did you like best about the course?

Notes

materials given ahead
class notes handed to us, is a fast paced course would be hard to keep up taking notes ourselves
notes were provided
notes were so complete and clear
liked the course content and lecture notes which are equivalent to a textbook
class notes very helpful

Videotape

video enhanced visual aids and notes
I liked the fact that I could check out a tape if I missed class,
being able to check out the tapes, nice to know you didn't have to miss any lectures, if missed a class could just get the tape and watch it at your convenience
ability to review the lecture if desired
if we missed a lecture, we were able to check out the video

Course Structure

some of the information provided was interesting and valuable
broad summary of knowledge

Course Material

material was interesting
visual effects and supplemental videos presented
some of the concepts and information covered were interesting and useful
topics are not too specific
I did learn a lot from this class, but it is information that I will never use again

Instructors

the classroom instructor could answer questions about the videos
the interaction between the students and the professors watching the course, I feel I have four other professors in addition to the ones giving the lecture, the first time I have more professors that classmates in a class
the best part was having professors who are considered experts in their fields teach on that particular topic or section of the course
lots of different professors provided lots of personality
variety of instructors

Review Sessions

review sessions given on Wednesday afternoons, very helpful in order to explain material further

What did you like least about the course?

Derivations

not knowing what is expected
too much derivations of formulas and laws
too much equations breakdown that you tend to lose focus

Exams

we have to wait three or four weeks to get a test back, are ready to see what we made, and have to wait on other classes to see what we made
homework, difficult to get help with homework problems, taped sessions are too long for own class discussion, as a result we have fallen behind
spacing of the exams
exams were all piled up towards end of course
getting exams back so late
the fact that the final exam is a report that has nothing to do with the rest of the semester, and that there is so little time to work on it from the time the last material on it is covered until it is due

Notes

bad format for reading
notes are not well organized
sometimes the notes are a little disorganized instructors move a little fast through some topics and if you miss something you can't exactly ask a question
notes did not follow the instructors exactly, the derivations were in the notes and not necessary to go over in class, getting tests back so late is very frustrating

Videotape

videotapes are boring needs more graphical concept explanation
sometimes difficult to tune in to the video replay sections of the course
not much of a video person this is taped, you tend to slide away or lose concentration during the 50 minute class length
reading along with the video
the format in which information was presented, most of the computer presentations were plain and boring
boring
some instructors were not very excited. It is hard to stay focused during a tape.

the media of videotape is not an effective way of teaching. Interaction need to be available between the students and the instructor
the videos make the lessons harder to understand and follow
the worst part of the course was the lectures. Watching a taped lecture got very redundant by the end of the course
equations and other quantitative data was delivered a bit too quickly

Course Structure

a lot of material seemed to be just thrown together with no explanation of why it was relevant
not enough organization, we never knew how we were doing in the class compared to the other schools
it was too detailed for a general course
difficult to compare to other courses because I never met two of the instructors

Instructors

additionally, all the professors basically read through the notes. Also the point is quickly lost when an instructor reads through a long derivation from the notes

Time

we had to meet an extra time to learn what was on the videotape
there was not enough time to view tapes and discuss them
most of the weeks we have had to meet for an extra class period to understand what's been covered in the videos

What suggestions do you have to improve the course?

Examples

more example problems
to have more examples in the book, there is a limited amount
present more examples
many examples and discussions were too drawn out

Exams

space exams more evenly and get them back to us more quickly.
grade assignments and exams faster

Videotape

make lectures on video at a faster pace
having each video at the beginning tell what pages of notes it covers
it is easy to daydream while watching a videotape, I suggest to have the instructor stop the tape every 15-20 minutes to explain something , this will get the class' attention

make number of videotapes equal to number of times class meets, taking into consideration discussion in the length of each presentation
if the videos are going to be used, they should be shortened so the instructor can answer questions
videotapes should be shortened so the instructor can discuss the course
make shorter videos
to allow for questions, the tape length needs to be reduced. The tape length right now is normally sill over a normal class period

Equations

cut down on mathematical derivations
less derivations
perhaps the derivation could be supplied in the notes and talked about briefly in the presentation
shorten times spent deriving equations. Don't overload with 80 equations. Point out the important material

Notes

highlighting main points or ideas in the notes
edit and prepare notes from a copy center
it would make the class less boring if he class notes handed out weren't as complete. This way students must pay more attention and add to the notes as they watch the lectures
more focus on concepts and examples

Homework

work out homework before giving it to the students to make sure there are no errors in it and that it can be done using information in the lectures and notes

Interaction

more interaction with students
videotapes should be made shorter, this would allow for the instructor to answer questions and give input

Course Structure

make it all a little more organized
given the intent of the course I think it is going well
maybe if the sessions were live from other surrounding universities
organize all materials before new semester and prepare exams carefully

Instructors

have instructors define the purpose better and how the given subject fits into the big picture, maybe some more focus could be put on the point of it all and less on derivations

combine the diffusion topic into one segment instead of Instructor B discussing it at end of his lectures, then Instructor A discusses a variety of topics and then returns to diffusions

better communication between professors about what is expected of students

instructors need to be more enthusiastic

Additional comments

Exams

exams should be prepared by the same person or persons. Personally, I get very nervous whenever I take a first exam with a professor I don't know, simple because I don't know what to expect or the professor's style of exam making. I also don't know what to expect with each exam because of the variety of professors teaching the class

the exams should be given at more regular intervals, and should be returned to us faster

we have taken 3 tests and had one returned

none of us have any idea about where our grades stand in this course and I think we should

Time

this course tried to cover way too much material for the time allowed

when you are so pressed for time that the can go through 125 overheads in 50 minutes, something is wrong

the fact that there is not enough time in the regular class period, so we had about two hours a week of "extra" class time for discussion

out of class time had to be spent because of too much material being covered

Homework

the work load was perfect, but some attention might be given to the clarity of some homework questions. They were workable once you figured out what they wanted

the tests should be graded and returned quickly

Course Structure

structure of the course was poor

syllabus was not followed

this class should be used for people in their option and not as a general requirement

Miscellaneous

what is forage

APPENDIX D

INSTRUCTORS' COMMENTS

Instructors' Comments

(All of the comments listed below are direct quotes provided by the instructors involved in the study.)

What worked well for the course?

Instructor A

having tapes themselves, good if want to review
through the instructors eyes -learning new technique very beneficial, for me a challenge, had to learn multi-media package and I had not done that before different visuals through multi-media, don't go to tape video with near the visuals have been using in the classroom, really had to get much better quality visuals
tapes to tapes worked well

Instructor B

notes good - because each taught our parts before
think the students the students learned a lot - even though weren't overly joyed taking a course this way
had a team of people, let some other things slide to make this happen
expose students to diversity of expertise
coordinating times not bad
getting tapes from school to school

Instructor C

a number of people with different expertise, some parts of would have had to spend hours getting prepared for the class
students received good notes, were edited, information very well organized
notes were the start of a text or best course packet ever seen
Assets of the course: 1) couldn't pull together team at one university, 2) information organized & well prepared- notes, 3) quantitative - covers biology
lectures were well prepared
all decided to work together to get this done

Instructor D

good attempt at overall communication of instructors, conscious effort of everyone tried their best that they could do
electronic communication was good- email and sending of tapes, written materials
course very organized
little picture on screen of instructor for students to see along with notes or whatever

What didn't work well for the course?

Instructor A

not exact what going to teach
with videotape no dead time when taping - 15 seconds dead time seems forever live, but not in a regular classroom
felt at time too involved with presentation and had difficulty communicating with students
not too involved with students when taping live
having a common definition of biological process
need more literature reviews, in past gave lit reviews then students gave oral and written presentations

Instructor B

lectures too long for a 50 minute period- need more discussion time
too much attention to detail to certain parts and not enough on what all this means
derive own equations
need more assignments
structure classes so tapes are 30 minutes long and discuss what does this mean
email from students

Instructor C

certain subjects covered too much, thus leaving others out
some instructors read strait from the notes - I actually brought something else to do during the class
lectures should cover more than the notes
imbalance of instruction - totally based on instructor A's class at first
information limited to notes and lectures

Instructor D

received videotapes on time - but had to run so receiving instructor fell further and further behind get 3 tapes from someone not 3 lectures but 4 lectures for me
not a perfect system despite the best attempts
had to double up to catch up
overlap on tapes
schedule conflict - when start school, holidays, spring break
50 minute lectures too long
4 instructors trying to teach - difficult what is important/not extreme approaches - throws the course/ students off balance
lecture notes very detailed so why come to the lectures at all
note quality to lecture quality = 1:1

What suggestions do you have for the course?

Instructor A

handed out notes day by day so knew what notes to use
give more literature reviews

Instructor B

shorten tapes
have a series of questions and objectives for each lecture, may only have 1 hour of lecture or 40 minutes then have to do an assignment so not lecture every time or 30 minute lecture and 20 minute discussion
questions students must answer at end of each lecture
should learn the need to know
the objectives should be when students leave they understand how to model biological processes, starting with microbes, plants and animals

Instructor C

more outside readings
more balance raising questions from instructor
learn by doing - more assignments
exams not adequately cover information
tapes too long
tapes should be no longer than 30 minutes
students need contact with instructors
homework problems need to be edited
little problems in regular classroom are magnified in a distance education classroom

Instructor D

no 50 minute lectures
covered too much material
quite a bit of variation to course with 4 different personalities & prejudices on various subjects as would be
I was flying through my stuff but maybe that was good enough. Would ask for 1-2 more lectures

Would you teach a course through videotaped instruction again?

Instructor A - YES
Instructor B - YES
Instructor C - YES
Instructor D - YES

Additional Comments

Instructor A

went in over Christmas break and did a mock lecture, were people there to help then, but after that no help
notes were from previous course
was a lot of work but glad I did it
organized

Instructor B

had a team of people, let some other things slide to make this happen
if had a choice between videotaped instruction and no instruction yes would do it again
yes organized - clear objectives and outline followed

Instructor C

had no formal distance education training
the opportunity to contact each instructor existed, students however didn't use it - instructors had called me to ask questions for their students
don't think should tape in front of a live audience - then can do lecture of 40 minutes with no interactions or disruptions, then everyone could use that tape with 20 minutes to take care of questions, or business
works better with no audience when have extensive video or overheads
made notes after made the tape

Instructor D

did have contact with instructor B and instructor C on final
yes/no on formal distance education formal training - read some literature on distance education from a colleague
reading notes- can have course without videotapes here's the notes read and take test and do homework
agreed at one level, but when really came down to it, each had our own views what was important, and how we were going to do it
if you are the only one teaching a course, and you are the only one you have to satisfy you can do what ever you want, but you know if you do something on this end you will be penalized later on. But if you and I are teaching this course, if I can get mine in your on your own
no friction among instructors, we cut a deal, you've got this many lectures, you've got this many, we started out with 45-50 lectures but ended up with 55-60
some of the material was firmly developed going in and others was not
extremely well organized - they're (students) comparing it (I'm guessing) to a regular course that has been taught 25 times. This is a course of 4 different people teaching a course who started with nothing

told students at beginning - you are guinea pigs, this is an experiment, there will be some things you have to put up with
thoroughly enjoyed it, could put all on computer for quality material

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 03-01-96 **IRB#:** AG-96-018

Proposal Title: THE EFFECTIVENESS OF VIDEOTAPED INSTRUCTION VS. ON-SITE INSTRUCTION IN AN AGRICULTURAL ENGINEERING AND BIOSYSTEMS COURSE ENTITLED "ENGINEERING QUANTIFICATION OF BIOLOGICAL SYSTEMS"

Principal Investigator(s): Bill Weeks, Amy Atherton

Reviewed and Proeessed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

Signature: John H. Wyckoff Date: March 14, 1996

Chair of Institutional Review Board

VITA

Amy Jenee Atherton

Candidate for the Degree of

Master of Science

Thesis: THE EFFECTIVENESS OF VIDEOTAPED INSTRUCTION VERSUS ON-SITE INSTRUCTION IN A COURSE ENTITLED "ENGINEERING QUANTIFICATION OF BIOLOGICAL SYSTEMS"

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